The Engineering and Mining Journal

WITH WHICH IS CONSOLIDATED "MINING AND METALLURGY."

VOL. LXXIV. NEW YORK, SATURDAY, August 2, 1902. No. 5.

THE ENGINEERING AND MINING JOURNAL
(Incorporated.)
261 BROADWAY, NEW YORK.

TELEPHONE. 6866 CORTLANDT. P. O. BOX, 1833.
CABLE ADDRESS "ENGMINJOUR" N. Y."

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Single Copies, 15 Cents.
United States, Canada, Mexico, yearly, 52 copies, in advance, $5.00
Other countries in Postal Union, $7.00
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English Subscriptions Payable at London Office, £1 8s 9d

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THE ACTIVITY in the iron trade last year stimulated production in the old iron mines of New Jersey, as well as in other districts. For ten years past the output of these mines had been gradually decreasing; in 1899 and 1900 there were slight gains, but last year there was a large one, bringing the total production up to 401,151 tons, the largest reported since 1892. The gain was not the result of any new discoveries or new mines, but was due to more active working of well known mines—such as the Hurd, the Mount Pleasant and the Wharton. It shows that the iron mines of the State are not exhausted and can still furnish a notable quantity of ore when the demand exists.

⚒

THE REPORT of the Calumet & Hecla Mining Company, which is given on another page, contains hardly any more information than those heretofore issued by the company. It gives the quantity of refined copper produced in the fiscal year ending with April last at 42,462 tons, an increase of 5,070 tons over the preceding year. As to the earnings of the company, the cost of producing copper and other details of operations we are left entirely in the dark. As the stockholders still seem disposed to submit to the suppression of information which they have a clear right to receive, nothing can be done about the matter; but we cannot pass the opportunity to protest once more against the secretive policy so manifestly unjust to stockholders and to the public.

⚒

DIVIDENDS PAYMENTS in July by mining and other companies identified with the mineral industry of the United States show a heavy falling off as compared with the previous months this year. During the month 56 concerns reported a total of $4,764,898, the bulk of which was paid by the gold and silver and the coal and coke properties. Several regular payers reduced their dividends, and a few that were in the quarterly list, have dropped out altogether. In these instances the surplus earnings have gone to further developing the properties, and making improvements in the machinery for treating the ore so as to put the companies on a more solid basis.

In Mexico 13 mines and metallurgical works paid $143,488 in dividends in July, which is somewhat less than June, owing to the fall in exchange. One Central American mine, owned in New York paid $15,000, and one Canadian, $12,500.

⚒

A GOOD SUBJECT for thought and consideration during the recess of Congress is the amendment to the mining law introduced by Senator Kearns, of Utah, during the last session. This amendment is brief and to the point; it provides that mining locations hereafter shall be rectangular in form not to exceed 1,500 by 1,500 feet in size, and that they shall confer the "right of possession and enjoyment of all surface included in the lines of the location, and of all veins, lodes, ledges and mineral deposits throughout their entire depth which lie within such surface lines extended downward vertically." In brief, it does away with the entire doctrine of extra-lateral rights, which has been productive of such endless trouble and litigation.

Naturally, this bill was held in committee, but its free discussion and evidence that miners generally demand its passage may result in some action at the next session of Congress. It should not be forgotten. Our readers need not be told that we are heartily in favor of the principle involved in the bill, and we believe that a great majority of them agree with us. It is important that as many of them as possible should make themselves heard on this subject. We propose shortly to discuss it at greater length, though we hardly think that further argument in its favor is needed.

⚒

OUR LONDON correspondent has from time to time during last two years referred to a company called the Siberian Gold-field Development Company, shares of which were sold to the British public by the Hooley crowd, although the company has never acquired the properties and in fact had no status in Russia at all. Some editorial comment was also made. The company has since been re-organized as the Nerschink Gold Company, Limited, with a capital of £1,100,000 in £1 shares on which there is a liability of 2 shillings. The formal authorization of the Imperial Russian Government permitting the company to trade in Russia, has just been received in London, and an expedition of mining men to examine the properties has been dispatched by Mr. Arthur L. Pearse. The leader of the expedition is a mining man of considerable experience in dredging in New Zealand, so the complicated problems before the company as regards the value of its properties are in good hands. The company has plenty of funds in hand, but of course its capital is far too high and is watered by an excessively large purchase consideration in shares. There appears to be some friction between members of the board representing different interests, but it is to be hoped that the members of the board representing the interests of the shareholders who bought shares for cash from the Hooley vendors will receive some consideration when expressing their views as to future policy. It should be added that one of the stipulations of the Russian Government is that no member of the Hooley group shall take any part in or exercise any influence on the management. The future of the company depends entirely on the value of the properties, which had never been properly examined when the original company was formed.

⚒

MARKET CONDITIONS.

Iron and Steel.—The iron market is somewhat quieter. The pressure for foundry iron has abated, in view of the prospect of sufficient supplies. The general resumption of the Alabama furnaces and the probability of a near end of the anthracite strike promise a better supply of iron from our own furnaces; while offerings of foreign iron are more freely made. As to the latter, there has been some buying of pig iron, chiefly foundry grades, in Great Britain. Some negotiations have been going on in Germany, but it is said that makers there are not willing to make prices to suit our buyers.

In finished material the market is comparatively quiet. While there is plenty of business there is less pressure for deliveries. The only special activity is in structural steel, for which demand is still strong.

Copper.—The market continues quiet and rather dull. Consumption continues large, but manufacturers do not seem to be buying ahead to any ex-

tent, being contented to take only for their immediate needs. On the other hand the metal is not being pressed for sale, and apparently no change can be expected till the vacation season is over.

Other Metals.—There is comparatively little new with regard to tin. The market has been rather heavy with a downward tendency in prices. Consumers are purchasing apparently only for their immediate necessities, although the amount is sufficient to make up a fair business. Abroad, the speculative tendency is becoming more marked and there is some uncertainty as to the future.

Lead remains quiet with about the usual amount of business doing at unchanged prices. This market has been steady so long that consumers have fallen into the habit of buying only as they require supplies.

Spelter is still strong and somewhat excited. Prices remain at a high level. The consumption is large and makers are not pressing sales even at the present high quotations. Prices of ore in the Joplin district are a little lower, but business is very good indeed there.

Silver is still dull and no change in the market is apparent. The French Mint orders, which were of moderate size only, have been filled and the demand for India has been light. No settlement has been reached as to the Chinese indemnity, but it is reported that the European powers will not agree to the proposal by England and the United States to accept payment of installments in silver at current value instead of at a fixed exchange for the tael.

Coal.—The Western coal market continues to be affected unfavorably by the transportation conditions, the lake trade being especially disturbed by the failure of the railroads to meet the requirements of lake shippers. In the local trade at the large cities, however, conditions are somewhat better. In the Pittsburg District, continued shipments of river coal have been possible owing to high water. There is a report that the Monongahela Consolidated Company proposes to enter into competition with the Pittsburg Consolidated Company for at least a portion of the railroad trade.

The seaboard bituminous coal trade shows little change with the exception of an increase in speculative business at New York and Philadelphia. Prices continue unsettled, affected by the extra demand from consumers in the large cities who have heretofore used anthracite.

The anthracite trade is still practically dead. There are rumors of an approaching attempt to start up the mines, but nothing definite has been done as yet.

⚒

PIG IRON PRODUCTION IN 1902.

The report which the American Iron and Steel Association has issued with its usual commendable promptness shows that in the first half of the current year the blast furnaces of the United States again exceeded the record of production made in 1901. The total production of pig iron in the six months ending June 30 reached the great total of 8,808,574 long tons, exceeding by 1,133,961 tons, or 14.8 per cent, that of the first half of 1901, and by 604,833 tons, or 7.4 per cent, the great output of the second half of that year. The half-year's production was, in fact, more by 1,042,744 tons than that of Great Britain for the entire year 1901, and by 1,071,941 tons that of Germany for the same year.

One notable feature in this statement is the increase of basic pig, which was in greater proportion than that of bessemer iron, or of any other description. For the first time the output of basic iron exceeded 1,000,000 tons in a half-year, or 10 per cent. of the total. It shows the continuous growth of the basic steel process in this country.

The figures for bessemer pig in 1902 include 81,818 tons of low-phosphorus pig iron. In 1901 the production of low-phosphorus pig iron was not separately ascertained, but is included with bessemer pig iron.

The details of the production by States are given on another page. The output, classified by descriptions of iron, was as follows, in long tons:

	1901, First half.		1901, Second half.		1902, First half.	
	Tons.	Per ct.	Tons.	Per ct.	Tons.	Per ct.
Foundry and forge.....	2,311,401	30.1	2,229,849	27.2	2,530,566	28.7
Bessemer pig.....	4,582,187	59.7	5,014,606	61.1	5,105,932	58.0
Basic pig.....	645,105	8.4	803,745	9.8	1,053,274	12.0
Spiegel and ferro.....	135,920	1.8	155,541	1.9	118,982	1.3
Totals	7,674,613	100.0	8,203,741	100.0	8,808,754	100.0

Nearly all of our great production was made with coke and coal as fuel, by far the greater part of it with coke. There is still, however, some charcoal iron made which has certain special uses. The production of charcoal pig iron in the first half of 1902 was 186,998 gross tons, against 194,231 tons in the first half of 1901 and 165,916 tons in the second half of 1901. In addition there were produced in Tennessee in the first six months of this year 6,004 tons of pig iron with mixed charcoal and coke.

In the first half of 1902 there were 286 furnaces in blast, so that the average output per furnace was 30,799 tons per furnace. Excluding the charcoal furnaces, which are generally of small size. The average was 33,619 tons per furnace.

The total production of the year ending June 30 last—the second half of 1901 and the first half of 1902—was 17,012,315 tons of pig iron. Notwithstanding the stoppage of some furnaces by the anthracite strike, it seems quite probable that the full year of 1902 may see a production of 18,000,000 tons—if not in excess of that figure.

⚒

RECOGNITION.

Experienced operators in the anthracite region have been accustomed to look for important strikes at intervals of about a dozen years. Their explanation used to be that this period was required to enable the labor organizations to recover from the effects of a strike; to forget how little they had gained by it in comparison with what they had lost, and to raise up a generation of young men who had no knowledge of the hardships of such an enterprise and were eager for the excitement of it. In fact, the older miners, who owned houses and lots and had money in bank (or at still better rates of interest in the hands of their employers), have always opposed strikes, but have been overborne by the hotheaded young men. It is a significant fact, moreover, that the "bosses," or foremen, have always been stanchly loyal to their duty on such occasions. Yet these men were only miners, more intelligent than the rest, and therefore advanced to higher responsibilities. The striking miners have never included men who knew enough to run a colliery.

In connection with the strike of 1887-8 I published (in this journal, January 14, 1888) a careful statement of causes and conditions, which might be well nigh repeated *verbatim* as a description of the present situation. Then, as now, the strike was "part of a deliberate plan to conquer, once for all, the anthracite business"—and this was part of a wider and wilder plan to rule the country, in spite of law and justice, by a comparatively small minority of its laborers, arrogating to themselves the title of representing "labor." Then, as now, the anthracite miners were commanded to strike by the leaders of organizations not connected with the anthracite business. Then it was Mr. Powderly, the head of the Knights of Labor, who acted as commander-in-chief. In one view of the matter this was more ridiculous than the domination of Mr. Mitchell; for the Knights of Labor, comprising cigarmakers, silk weavers, car drivers, etc., was a ludicrous aggregation of disinterested ignorance. But, in fact, the present control of the anthracite miners by Mr. Mitchell, the representative of a rival industry, is more dangerous to them, though more dignified to the public eye, than the motley authority which shouted its commands to them fourteen years ago. Yet the same element appears in both cases—the doctrine and dream of an impossible "solidarity" of "labor"—the conception of industrial society as a state of chronic war, interspersed with temporary truces.

The strike of 1900 came on time; and if it had been fought out, like its predecessors, we should not have had the strike of to-day, which is, in fact, only the renewal of the conflict then postponed, and aggravated by concessions, which, though not constituting a surrender on the part of the operators, were interpreted by the "labor leaders" as so much of victory won and a pledge of success in the further campaign. Anything that can be construed as a "recognition" of the Mine-Workers' Union is now the aim pursued. "Recognition" sounds innocent enough; it is the least that courtesy requires in common life, and many good people seem to think that employers are highly churlish and selfish if they will not even "recognize" the union.

But our modern labor unions have a dictionary of their own; that book, like all dictionaries, reflects current usage; and, recalling what the last few years have given us of this usage, we see that "recognition" means, first of all, that the union shall dictate who shall be employed and who discharged; that it shall fix not only the day's length and the day's pay, but also the day's performance; that "non-union" labor shall not be permitted; that discipline shall be subject to the approval of the union; that boycotts declared by it shall be obeyed by the employer. In one case, I remember, he was required to reserve from the wages of his men their dues and fines, and pay these to the union. When he declined to do this unlawful thing he was commanded to discharge a man who had refused to pay a fine; and when he refused to obey, a strike was ordered which lasted for months and involved some 20,000 workmen. All this because he had committed the very simple and innocent mistake of "recognizing" a union.

"Recognition" involves the free admission of the "walking delegate" or his equivalent into all works, shops or mines, for the purpose of detecting "scabs," or union members in bad standing—*i. e.*, in arrears for dues. In some places and trades it means that neither owner nor foreman can give orders to his individual employees. All communication with them must be had through an official of their own choosing.

And, finally (though there is no reason for closing the list here, except the lack of space for further items), "recognition" means that every contract or agreement made with a given union or branch may be broken at the will of some larger body when it is believed that the interests of labor in general require such a violation of promise.

I know that Mr. Mitchell made an excellent speech at Indianapolis, in which he urged the national convention of his union not to order a general strike, which would violate contracts. But his skirts are not cleared completely by that late disclaimer. After all, I cannot find in his address anything higher than arguments of policy. There are earnest representations of the unwisdom of the step; of the bad effect it would have on the public; of the general failure of sympathetic strikes; but no manly declaration that

the thing itself would be wicked; that, if it were ordered, he would resign rather than be the agent to carry out such bad faith. On the contrary, the impression cannot be escaped that Mr. Mitchell was prepared to go on and do his best, accepting the vote of the convention as his sufficient moral warrant. In the Hazleton convention he had opposed the strike, and when it was voted over his head made haste to organize it and justify it as a rebellion against "intolerable" conditions. That is what he would have done if the Indianapolis convention had ordered the larger strike which he deprecated. He believes, just as much as anybody, that such an order must be obeyed, and that it supersedes local obligations, even of honor; for this construction of such obligations is involved in the "recognition" of the union. Even now his official committees are reported to be notifying bituminous coal operators that if their coal gets to anthracite-using districts, so as to relieve the suffering and loss of the public, their workmen will be peremptorily called out, contract or no contract.

But it is scarcely necessary to bring any proofs beyond the significant and comprehensive fact that a convention called by Mr. Mitchell and representing, with his knowledge, numerous bodies of workmen bound by contracts, deliberates whether it shall order those contracts to be broken, and is addressed by him as if it had the right to give that order.

The only escape from this conclusion is the declaration often made that the bituminous miners could have broken their agreements without dishonor, because all such agreements contained or implied the proviso that sympathetic strikes might make it necessary to break them. Very well. Then I am justified in repeating that "recognition" involves the unreliability of all promises made by the union. If a man hires non-union laborers they will be bound by their agreements; if he "recognizes" the union his laborers will not be so bound. They may or not be true to him—that will depend upon a convention held to consider the question, and upon the nature of the speeches there made by Mr. Mitchell and others!

Is it any wonder that those who know the union best are least inclined to "recognize" it?

But there are two other kinds of "recognition," though they do not go by that name, and usage has fixed meanings for these, also.

The first is the recognition of the union by magistrates, judges, sheriffs, legislators, shopkeepers, priests, doctors, publishers and editors. This involves what is called "fair" treatment of the members and acts of the union, and aid, both active and passive, in its holy war upon the hostile, the lukewarm and the would-be independent (*i. e.*, according to usage, the "scab"). Credit must be given to the men who have sworn not to work; cash must be refused from those who are working, and those who are trying to protect the workers from violence. All statutes made to guard person or property from violence or conspiracy must contain provisions explicitly exempting "labor unions" from their operation. Governors must not call out troops, and, above all, the power of the United States must not be invoked when local powers have failed, for the soldiers of Uncle Samuel have a most uncomfortable way of not recognizing "labor" or anything else when it is engaged in breaking the peace.

But there remains the "recognition" of the union which is exacted from its own members and other wage-earners. To the members it means, among other things, that they must abandon work without grievance or knowledge of grievance (as the bridge strikers in New York have just done) at the command of organized labor in general; that when they thus strike they will get no help in money (as the unions who struck in aid of the steelworkers found out); that when, at last, relief is provided or promised, it will be given, if given at all, to the shiftless only, and not to those who have saved money; in other words, that a member of the union is expected to contribute to its fighting fund, not merely all that he has paid into its treasury for that purpose, but also all that he has laid by for his wife and children. And when, impoverished and discouraged, he returns to work (if luck has favored "labor"), with 10 per cent. increase of wages, or some "concession" of that sort, and reflects that he sacrificed 50 per cent. of his year's earnings to secure this result, he is expected to join in the chorus, "But 'twas a famous victory!" and commence to lay up money for another! Truly this kind of recognition is the cruellest of all, and we are amazed that thousands of honest and well-meaning men are betrayed into it. The cause is two-fold. It is partly terrorism and partly a spirit of heroic, unselfish self-sacrifice for the sake of organized labor in general. The nature and extent of the terrorism has never been adequately told. It is largely ignored by philanthropic theorists as a mere incident in the elevation of "labor." The unselfish sacrifice, on the other hand, has been abundantly lauded, without due exposure of the false basis on which it rests, and, in view of which, it is as lamentable as the bravery of the followers of the Mahdi.

Perhaps I may add that there is still one more way of recognizing the most modern form of "labor unionism"—namely, by seeing in it the familiar features of old errors, old tyrannies, old schemes of the demagogue and the bandit, old class antagonisms, artificially revived, old traps for the sympathetic, and old lures for the unscrupulous. It seems to me, sometimes, that I *do* recognize the union, after all!

R. W. RAYMOND.

MINERAL PRODUCTION OF BOSNIA.

The mineral production of Bosnia, including Herzegovina, has made steady progress since those provinces have been under Austrian rule. The output of ores and minerals for 1901 is reported as follows, in metric tons: Copper ores, 3,696 tons; black copper ore (fahlerz), 1,041 tons; iron ore, 122,569 tons; chrome ore, 505 tons; manganese ore, 6,346 tons; iron pyrites, 4,570 tons; lignite, 445,007 tons; salt brine from wells and lakes, 1,558,581 hectoliters.

The production of the iron works—chiefly charcoal furnaces and forges—was as follows: Pig iron, 35,164 metric tons; spiegeleisen and ferro-manganese, 4,131 tons; castings, 1,445 tons; bars and rolled or puddled iron, 16,500 tons; forgings, 163 tons; open-hearth steel ingots, 18,120 tons. All these products show considerable increases, except forgings.

The production of copper was 199 tons copper ingots and 38 tons copper sheets and other hammered ware; a total of 237 tons. Of other metals there was reported 9,300 kilograms quicksilver.

The production of salt by evaporation from lime was 16,865 metric tons, an increase of 1,066 tons over the preceding year.

The total value of the minerals mined or produced was estimated at 7,234,808 kroner; of the metals produced 3,042,041 kroner; a total of 10,276,849 kroner, or $2,086,200. This value shows an increase of 9.7 per cent over the year 1901.

PROCESS FOR PREPARING EXPLOSIVE SUBSTANCES.*

The author has ascertained that nitrated derivatives, nitric derivatives, picro-nitrated or picro-nitric derivatives are soluble in free fatty acids or in mixtures of them, and has thus been able to prepare compounds whose point of fusion is higher than that of those obtained by the solution, hot, of the same derivatives, in oils or fats, in which these fatty acids exist, combined in the state of ethers of glycerine. For obtaining the elevated point of fusion, it is sufficient to add a greater or less proportion of free fatty acids in these oils.

To manufacture the explosives, melt the fatty acid or the mixture of fatty acids, or the ethers of fatty acids of a base other than glycerine with the fatty acids or fatty bodies, and add nitrated, nitric, or picro-nitrated, or picro-nitric derivatives, alone or in mixture, keeping up the temperature for obtaining the solution.

When the solution is completed, add gradually the combustible material (heated), chlorate or perchlorate for example, shaking constantly so as to mix thoroughly and obtain a homogeneous mass, which is left to cool.

The following mixtures give good results:

1. Mixture with free fatty acid alone; free fatty acid (stearic acid), 12 parts; dinitro-benzol, 8; potassium chlorate, 80 parts.

2. Mixture with free fatty acid and fatty bodies; palmitic acid, 6 parts; oil or fat, 2; picro-nitrated, derivative (nitro-naphthalene), 10; picric acid, 2; ammonium perchlorate, 80 parts.

3. Mixture with fatty acid and the ether of fatty acid: Margaric acid, 7 parts; methyl stearate, 3; dinitro-tolune, 15; potassium perchlorate, 75 parts.

4. Mixture with free fatty acid of a previous solution of nitro derivatives: Stearic acid, 6 parts; monitro-naphthalene, 12; dinitro toluene, 2; potassium chlorate, 80 parts.

*M. Bonnet, in *La Revue des Produits Chimiques.*

PETROLEUM BRIQUETTES IN FRANCE.—The French Navy is experimenting on petroleum briquettes, made on the Gonnet process, with a view to their adoption. They are said to be composed of 97 per cent of carbon and 3 per cent of hydrogen. Volume for volume, they are half the weight of coal, and leave no more than from 2 to 3 per cent of residue. There is no cinder, the briquettes preserve their form like coal when burning, there is no smell and no smoke, and they may be damped without deterioration. They burn without exploding or sending off sparks, and give a large and clear flame. The mean calorific force of these briquettes is 13,000 calories. Other briquettes are made, half coal and half petroleum. They are cheaper, but are less advantageous owing to their density and less heat-producing power, which is 9,000 calories. The oil used comes from the United States, the French article containing too much fatty material for the purpose. When made from cheap petroleum and sold in large quantities, the price of the briquettes is about the same as that of coal.

THE SIBERIAN RAILROAD.—The Russian Government is reported to have decided to construct a branch line from Omsk to Tiumen to relieve the Siberian Railroad. The district between Omsk and Tiumen embraces some of the most fruitful territory in Western Siberia, and it is anticipated that a railroad joining those two places will not only greatly accelerate their development, but will also prove of military value.

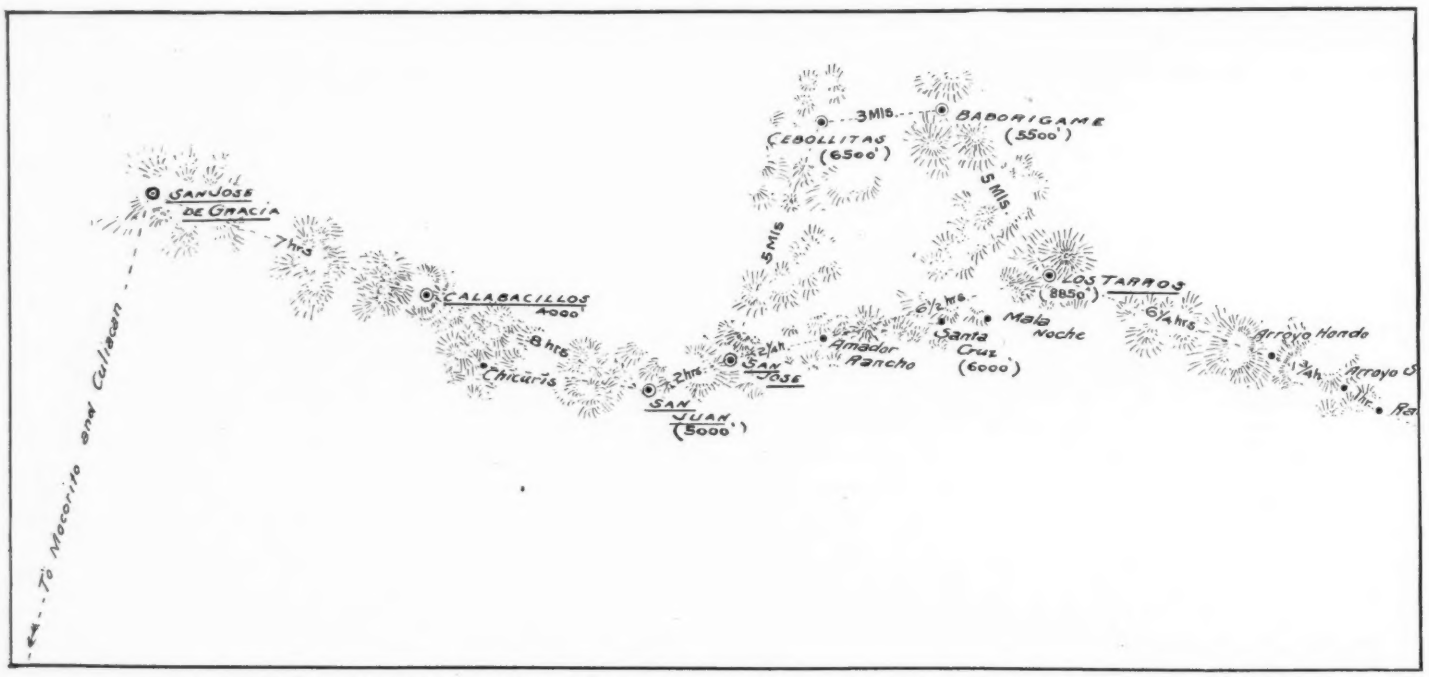
CO-OPERATIVE COAL MINING IN FRANCE.—The London *Colliery Guardian* says: "The Court of Appeals at Lyons, France, has just given judgment in a case referring to the Mine aux Mineurs, of Monthieux (Loire). It appears that the shareholders, who work the mines themselves, found that they stood in need of further aid, and of course employed fresh hands. But they took care to make them sign an engagement beforehand that, beyond the wages agreed upon, they would have no claim whatever on a share of the profits. This went on for some time, until at last the new men, naturally enough, thought they had as much right to participate in the proceeds as the original owners. The court decided against them, not so much because it thought their plea wrong in itself, but because in signing the document they had renounced any claims they might have had. The whole affair sheds rays of light on the scheme of co-operative mines. The Monthieux enterprise was begun some years ago with the express purpose of carrying out the Socialist doctrine that the proceeds of labor belonged solely to the laborer. In forcing the new men to forego any participation, the shareholders broke the principles on which the syndicate was founded."

THROUGH THE SIERRA MADRES IN CHIHUAHUA, MEXICO.

By GEORGE D. JAMES, M. E.

The mineral resources of the regions embraced in the State of Chihuahua, particularly the southwest, are practically unlimited; a recent trip by the writer included a visit to the principal mining camps, from Parral, across the Sierra Madres in a westerly and southwesterly direction, to a point near San José de Gracia, which necessitated a ride of about 300 miles to the western slope of the range in Sinaloa.

Leaving Jimenez on the Mexican Central Railway, 597 kilometers (or 371 miles) from El Paso, a branch line for 89 kilometers (or 56 miles) nearly due west, leads to Parral, at present one of the busiest camps in Mexico. Parral is situated on the line of two railways, the Mexican Central and the Parral and Durango railroads, Minas Nuevas being the terminus of the latter road, and Rosario the terminus of the Mexican Central. The transportation facilities in that section are therefore advantageous.



WESTERN HALF OF ROUTE FROM OJITA, CHIHUAH UA, TO SAN JOSE DE GARCIA, SINALOA, MEX.

Parral, or Hidalgo del Parral, was established in 1600, and while the date of the first mining operations is not known, the Jesus Maria and Tajo mines were being worked as early as 1632; in 1634 the report was officially made that silver ore carrying 240 ounces per ton had been discovered; from 1641 to 1649 the records show a registration of four and a half million ounces of silver, and from 1649 to 1688 two and a half million ounces. After that time the records fell into the hands of the French and were destroyed. Bancroft records Parral as being the second richest district in Chihuahua, having yielded $60,000,000 in gold. The most important district is Batopilas, which has produced from 100,000,000 to 300,000,000 ounces in silver. The Santa Rosa de Cusihuirachie was operated from 1666 to 1810, and produced 80,000,000 ounces in silver, when it was abandoned because of the revolution.

The mining districts of Parral may be divided into three principal sections—the Central District, surrounding the city; the Minas Nuevas District, and the Santa Barbara District, which also includes other camps. The old mines of these districts have experienced checkered careers; as modern methods became known, improved machinery, pumps, etc., were installed, in order to enable operations to be more economically conducted. In many cases it was found that the machinery was not adapted to the conditions and did more harm than good to the various properties. The workings of practically all of these show not only that ore has been found in vast quantities, but also that there is a large quantity either available for extraction at the present time, or that with systematic development regular shipments of a good quality of ore can be continuously made.

The veins of the Parral District are strong and well defined. The general formation is porphyry; the ores siliceous. At Parral the oldest and greatest producer is the Jesus Maria, which has been worked for 300 years; the records show a production of $7,500,000; the workings have a depth of 250 feet; the average width of vein being 16 feet, with values of 70 ounces in silver and a small percentage in gold. The ore shipments are distributed between the El Paso smelting works, the Mapimi reduction works and the Parral Milling Company's mill.

In the Minas Nuevas District, the "Veta Colorado," or red vein, so called from the red oxide of iron found therein, is well known; in fact, this wonderful vein is found to go through the ancient mines of that district, and is considered one of the greatest in the Republic of Mexico, being traceable fully ten miles from north to south, the average width about 300 feet. The depth attained by each of the properties is of large extent, some of them having shafts of 1,000 feet. Near the junction of the Veta Colorado and the San Patricio veins is located the Palmilla gold property, which produced during the last half of the past year $1,000,000, and at present is producing $150,000 per month. The Veta Grande Mine, on the Veta Colorado, with a development of 1,600 feet on the incline, has a strong vein averaging 16 feet, the values showing 45 ounces in silver. Then there are the El Verde, with a depth of 1,100 feet; the Presena and Alfarena, 1,000 feet; the Nopal, Pachuquena and Morena, 700 feet; the Quebradillas, 725 feet; Los Muertos, 680 feet; Bizcayna, 600 feet, and others.

Santa Barbara, 10 miles west of Parral, has the reputation of being the oldest camp in Northern Mexico. It was founded in 1547, at which time locations of several properties were made and operations commenced. The ore showed a value of 80 ounces per ton in gold, and seven hundred arrastras were kept at work; the copper, silver and lead values were not taken into account. This continued for several years, and the output of 100,000 ounces of gold per year resulted, until the Veta Colorado, of Minas Nuevas, was discovered, when the miners flocked to the scene of newer activity. The revolution also interfered with operations, and little was done at Santa Barbara until about 1850. At present the district contains about 4,000 inhabitants, and the properties operated on a small scale in the earlier days have proved themselves to be the most valuable now. The Tecolotes, operated by the Guggenheim Exploration Company, has, according to late reports, about $2,500,000 of gold, lead and silver in sight. This vein, with the Mina del Agua, including the Segobia property, can be traced for four miles along the mountains.

The deepest mine is the Alfarena, now worked about 500 feet down. The old workings expose ore (outside of the vein proper) with values of 25 per cent lead, 16 ounces silver and nearly one ounce in gold; the Mina del Agua has a development of 300 feet. Shale and slate constitute the general formation, and the veins run from north to south.

The capacity of the various reduction works at Parral and Santa Barbara aggregate about 1,400 tons daily, of which 870 tons are concentrating, 430 tons lixiviation, 50 tons from 30 stamps by the patio process, and 60 tons amalgamation and concentration. The Guggenheim Exploration Company's concentrating mill of 450 tons at Santa Barbara is the largest; the next is that of the Montezuma Lead Company, with 350 tons; while the concentrating and lixiviation works of the Parral Milling Company, with a capacity of 125 tons daily, ranks third; another lixiviation plant of 150 tons was building at the time of the writer's visit.

Leaving Parral, the trip was continued along the trails westerly and southwesterly into the Sierra Madras, passing in order the ranchos, ranchitos and canons of Chivite, Arroyo de Navarro, El Reparo, Arroyo del Maiz, Tres Hermanos, Lagunas, Guajalotes, Puerto del Aire, Rio Verde, Cueva del Burro, Las Iglesias, Cienega Prieta and Ojo Frio, and on the fifth day, or 28½ hours' ride from Ojito, the present terminus of the Parral and Durango Railroad, west of Parral, Guadalupe y Calvo was reached. This is the first town of importance west of Parral. It is located at an altitude of 7,300 feet. It was taken from the hacienda of the famous Rosario property, which about the middle of the last century was operated by an English company. Because of its productiveness and that of the surrounding districts a mint was established for the coinage of gold and silver. In 1858 the company failed to secure a renewal of the lease, and the property was abandoned; the machinery in the mint was dismantled and donated to the State of Sinaloa.

The Rosario property, according to the mint records, is credited with a production of over $19,000,000 in less than ten years; at the time of my visit the mill and cyanide plant were in operation. Senator W. A. Clarke, of Montana, has had exhaustive tests made of the ores in the mine and on the dumps under the superintendency of Mr. F. L. Sizer, to whom I am indebted for his courtesy during my visit.

The veins at Guadalupe y Calvo are said to have been discovered in 1835, and notwithstanding the immense revenues which have been taken from this

property, the development has not exceeded a few hundred feet in depth, and at the present time there is contained therein one of the largest bodies of gold and silver bearing ore in the Republic.

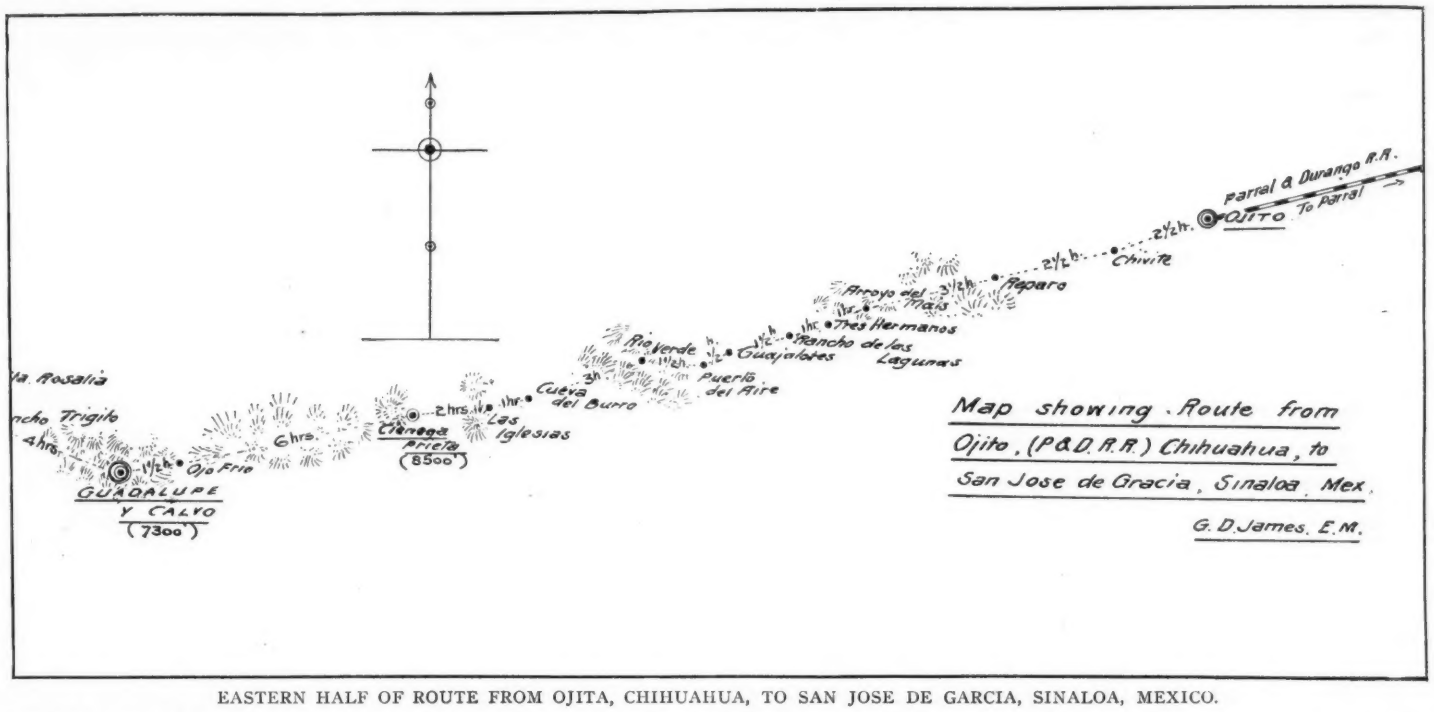
The other property of extent at this district is "La Independencia," which contains 153 acres of mineral lands and 8,800 acres of fine timber and woodland, the pines thereon ranging up to 60 feet in height. Here is a 10-stamp mill, with a 15-ton cyanide plant. The ore runs from $10 to $50 per ton in gold and silver. This property has not been in operation since its acquisition by the present owner.

The general formation is porphyry, with an overflow of a grayish-colored igneous rock; where it occurs it caps the veins; where the porphyry shows on the surface the veins crop out boldly and can easily be traced to the line of contact. True fissure veins characterize the district, the average width of vein being about 5 feet.

in the direct line of trail is San José de las Cruces, a telegraph station nine hours distant, at an elevation of 6,100 feet. The little village is reached after a steep descent from the mountains, and here are indications of past mining activity; smelters not set up and machinery on the ground, all apparently awaiting a short period when the operations (the past of which are recorded an every side) will be renewed with the benefits of modern methods. The interest which is now being shown in Mexican mines will find its way through this section, and the values extracted from so-called "ancient" mining properties will be repeated. They are there now, in fact, ready for shipment. The abundant water for power will be utilized and central points will be established to operate the surrounding mines. The great drawback in the way of acquiring such properties seems to be the distance from railway facilities. But when mills are on the ground, smelters in full blast, and ore has not to be hauled

generally northeast to southwest, with a dip either vertical, or nearly so. The width is about five feet.

There has been a great deal said concerning the richness of the dumps of Mexican mines and of the old workings. Some of the extravagances in this connection should be taken with a grain of salt and investigations should be made before they are accepted. There is, on the other hand, a great deal of truth in some of the assertions, for the reason—which will appeal to the one who may be conversant with Mexico—that in former times ore was encountered of a refractory nature, which could not be treated by the prevailing methods and, in consequence, was practically valueless, which at the present time will yield a large profit from smelter or other operations. Thus it is that when an old property is acquired a large value is sometimes encountered worth more than the price asked for the entire proposition. The Mexicans are adepts in the art of working the arrastra, and ore of a free-



EASTERN HALF OF ROUTE FROM OJITA, CHIHUAHUA, TO SAN JOSE DE GARCIA, SINALOA, MEXICO.

Leaving Guadalupe y Calvo, the journey was continued through the heart of the Sierra Madres, crossing the Arroyo Hondo, in the midst of unknown wealth. All is heavily wooded, the forests extending for miles in altitudes ranging from 6,000 to 10,000 feet, until the borders of the State of Sinaloa is reached.

The next day after leaving camp at Arroyo Hondo, Los Tarros was seen. Here were found evidences of American enterprise in the way of a practically new 10-stamp mill for the purpose of testing the ores of that district. A fine water-power, sufficient for all purposes and to spare, adjoins the property. The vein on the Los Tarros property is fully 100 feet wide. It is all gold-bearing, in some parts honeycombed, while values are realized throughout the entire width. Porphyry and quartz characterize the composition; while at lower workings, where tunnels have been driven into the hillsides, the ore is sulphide of iron, containing copper. In the arrastras the free-milling portion showed $30 per ton in gold, while the vein for 40 feet shows an average of $6 per ton in gold and 4 per cent copper. The remainder of the vein also shows values which will enable the entire width to be treated at a profit. It is stated that there is sufficient ore in this property to keep a 100-stamp mill in operation for an indefinite period, and the mining, hauling and treatment charges will not exceed $2 per ton in gold.

The location of the property is about eight miles from the Sinaloa River, the valley out of the canon being from 300 to 1,500 feet wide. The timber controlled around is unlimited, and most satisfactory results can be realized by tunnel operations.

Leaving Los Tarros, the next place of importance

any distance from the properties, it seems that poor transportation facilities should not prevent the acquisition of such rich properties as are found in this and many other districts away from the railway. True, the question of purchasing and transporting supplies is an important one; but when bullion can be made from plants on the properties this item is largely offset. It is well known that there are a great many operators who own and work their mines and realize immense returns in a quiet way, never advertising their properties for negotiations, of whom the world knows little or nothing, who prefer that a railway should not be constructed through their territory, because it would take away the seclusiveness which they prefer and inaugurate a competition not at present existing.

The San Jose District is known for its production of silver, and even now native silver can be seen in the slag from the crude methods of the former operations in smelting and reduction.

The ores were worked in arrastras and furnaces of small capacity, the "pasta," or sulphide of silver, was easily separated, and the small bands containing the highest values were gambocinoed for all they were worth. The dumps, rich even now in the metal, can be treated by concentration at a satisfactory profit. The galena is rich in silver, while the white quartz carries native silver easily extracted in the arrastra. With the modern smelter the ore will yield from $50 to $200 per ton, taking the vein average, and records of $4,000 per ton are extant.

Lime being one of the constituents of some of the formations, and with other natural characteristics, the various ores around this section can all be utilized in one general plan of reduction. The walls are well defined, the strike of the veins being

milling nature has generally nothing left of worth when they are done with it, but, aside from the arrastra, there is much room for improvement.

San Juan is reached in two hours from San Jose, and here also several classes of ore are found—free-milling, concentrating and smelting. The first when sorted shows values of 250 ounces in silver, with about $10 per ton in gold per ton; while the last has yielded a large amount of both silver and gold. Iron and copper pyrites are constituents of some of the other gold ores. The course of the veins is about northeast and southwest, with a dip similar to those at San Jose and vicinity. The formation is porphyritic.

About five miles from San Jose, in a northerly direction, is located the mining camp of Cebollitas. The ores here are of the same character practically as the other districts; gold, iron silver and lead. They are both free milling and smelting. Some of the porphyritic ores show values rich in gold, while others have the higher value in silver. The water supply from the San Miguel arroyo is ample for a large plant for all purposes.

Three miles east of Cebollitas is Baborigame, where postal communication is established for the country west of Guadalupe y Calvo. The formation here is porphyry, and the values and characteristics are similar to the others mentioned. Operations on a large scale were in force in this district about thirty years since, heavy machinery was installed and the mines worked until leases expired. Much to the regret of the operators, who were realizing large profits from their exertions, the properties were dismantled.

After leaving Los Tarros, en route to San Jose, a trail to the left leads to Mala Noche, where the

ores contain from 10 to 30 per cent copper, associated with silver, some of which is native. The veins are porphyritic quartz, wide and well defined.

Still further west, the remains of the old town of Santa Cruz are observed. Around this district are found old mines which contain ores of gold, silver and copper, amalgamation producing good results, as the gold values are high. Records of a large production are in existence. The water supply from the river is ample for all purposes, and a successful enterprise could be realized from operations in this locality. The veins are about five feet wide.

Passing beyond San Juan, a trail in a more southerly direction leads to the little mining camp of Chicuras, situated in a canon about two hours' ride from the top, where it is first seen. The little camp contains properties with valuable ores, assays of which, with the pulp, were shown me, one amounting to 27.10 ounces in gold and 9.45 ounces in silver per ton; a total value of $564.94 per ton. Another showed $77.94 per ton.

A day's ride from San Juan in a more direct line of trail brings us to Calabacillas, and here we are either in the State of Sinaloa, or near thereto; some say it is in Chihuahua, and it is generally so understood. In this section we leave the silver belts and come to those primitive formations where the ores are heavily decomposed; free milling and concentrating ores show high values. They have been subjected to intense heat, and are similar in appearance to a roasted ore, a reddish porphyritic quartz in which the gold in a free state largely predominates. The ore is rather soft, and with the ordinary amalgamation and concentration plant the values can nearly all be extracted. The tailings can be treated with cyanide.

The principal mine at Calabacillas is the San Geronimo, which can be taken as an illustration of the possibilities of the surrounding district. During the year prior to the erection of the present plant it is estimated that $100,000 were produced in bullion, the ore having been divided, according to the Mexican fashion, among the original owners, each taking charge of his proportion. In October, 1900, a plant consisting of a Bryan mill with concentrators was installed, and during that month a production of nearly $21,000 was realized, one-half of which was produced from the arrastras. This was shipped to Mazatlan. Up to the time of my visit to the property, over $90,000 gold had been produced from operations; this was on the basis of an average value of 3½ ounces in gold and 8.6 ounces silver per ton from the mill; the concentrates averaged 14.5 ounces gold and 4 ounces silver, or about $301 per ton, one ton being taken from 48 tons of ore; at the present time these concentrates may be figured at $125 per ton gold. The tailings may be averaged at $10 per ton gold, of which from 80 to 85 per cent can be extracted by cyanide treatment. There were about 4,000 tons on the dumps awaiting disposal. The average fineness of the gold was 857, and silver 102. The general samples taken from the cars at the mine in November, 1901, showed $21.50 per ton gold, while during September and October assays of richer portions of the vein averaged $437 per ton gold. More satisfactory results could be realized from the ores of this district, as the percentage of extraction could be increased were operations conducted in a more systematic manner by American operators in the place of Mexicans. Losses occur in amalgamation through millmen who do not understand as thoroughly as they should the application of quicksilver. At times too much is used; at others, too little; and while about 76 per cent extraction was shown from both amalgamation and concentration in October, 1900, and 63 per cent in November, 1901, with efficient operators 75 per cent could be saved upon the plates alone. It will be noticed, therefore, that the tailings resulting from such a percentage of extraction must be necessarily rich.

The San Geronimo has a development of 2,500 feet, the shaft being 275 feet down, with several levels and cross-cuts, the veins are from five to seven feet wide. From 35 to 50 men are employed daily, all Mexicans. The wages range from 75 cents to $4 Mexican per day, the latter being paid to machinists. About 10 tons per day were being shipped at the time of my visit. The cost per foot in running the levels is $8 Mexican. Wood costs from $3.50 to $4 per cord, of 128 cubic feet; charcoal one cent per pound, delivered at the mine. Two routes may be taken to reach this district, it being near the Pacific or western slope of the Sierra Madres: (1) From San Francisco to Mazatlan, thence along the coast north to Altata; or (2) from Guaymas south to Altata, both by steamship. A railway runs from Altata to Culiacan, 40 miles distant; by stage from Culiacan to Mocorito in 18 hours, fare $4 Mexican, from November 1 to May 31; thence in a private conveyance to Bacubirito in four hours and to Tamochina in two hours. From Tamochina mules are taken to San Jose de Gracia, nine hours; thence to Calabacillas in one day. This trip is easier than the one taken by the writer from Parral westward, the trails being less mountainous. From Parral the mule trails are entirely across the Sierras for a distance of about 280 miles. Machinery and supplies usually go by way of San Francisco to Mazatlan, thence to Perihuete by water; to Cienega by teams, thence to the district on muleback; the total freight charges from San Francisco are about $25 per ton in gold.

A short distance from this district brings one to the mining districts of the State of Sinaloa, where records of great production are again found. The Tajo in the Rosario District produced $12,000,000, and the Guadalupe de los Reyes $85,000,000, the ore ranging from $85 to $115 per ton. At Bacubirito are gravel deposits where nuggets of over 30 ounces in gold have been found.

The climate throughout is all that could be desired, the altitudes acting as a preventive against malaria or other complaints.

A description of the country embraced in a journey from the Eastern to the Western slopes of the backbone of Mexico in this space must necessarily be brief. Many mining districts leading to the north and south, with records of large production, which prove the vast amount of wealth stored in this section, are omitted. Railway facilities have been projected and surveyed, and there is room for others. There is ample opportunity for the introduction of all processes for the reduction of ores, whether the stamp mill, concentration, smelting, lixiviation or chlorination.

BROWN COAL IN BOHEMIA.—Statistics of the production of brown coal in the northern part of Bohemia for the year 1901, just published, show a yield of 18,283,498 tons—an increase of 992,401 tons, or 5.4 per cent, over 1900, when a strike of the miners, lasting two months, materially reduced the output. The number of miners employed in 1901 was 37,777, each of whom mined on an average 487 tons during the year—a decrease of 27 tons per man in comparison with 1900, doubtless due to the time concessions gained by the strikers. The total value of the output was 95,207,143 crowns ($19,327,050), or $1.057 per ton; an increase of 6 cents per ton, also presumably caused by concessions made to the strikers.

FULLER'S EARTH PRODUCTION.—The reports made to the United States Geological Survey show that the production of fuller's earth in 1901 was 14,112 short tons, an increase of 4,414 short tons or 45 per cent over the production of the previous year. This is the largest production since 1898. The greater part of last year's product was obtained from the vicinity of Quincy, Florida. Small quantities were contributed by three other States—Arkansas, Colorado, and New York.

Not only in the production, but also in the importation of fuller's earth into the United States was there a noticeable increase. Of the unmanufactured material 2,918 long tons; of manufactured fuller's earth 7,851 long tons; a total importation of 10,769 tons. During 1900 8,173 long tons were imported.

NOTES ON BRAZILIAN GOLD ORES.

By ORVILLE A. DERBY, Sao Paulo, Brazil.

In view of the recent important discussions before the Institute on the genesis of metalliferous deposits, certain features in the occurrence of gold which seem to be more clearly developed in Brazil than elsewhere can hardly fail to be of interest. The observations will be presented in the form of brief notes, without any attempt to draw conclusions as to their genetic significance.

Gold in Gneiss.—The statement made by me many years ago that in the districts of Campanha and Saõ Gonçalo, in Southern Minas Geraes, gold occurs in gneiss, can now be reaffirmed in the most positive manner, on the strength of a recent examination of fresh material, confirmed by the testimony of an experienced mining captain from the Morro Velho mine, who, being sceptical on this point, made a prospecting tour in the district. The specimens examined, though so far decomposed as to be readily disaggregated, were clearly of typical gneiss, with the characteristics of a sheared granite, composed principally of feldspar and quartz, nearly free from mica, and showing no evidence of having contained more pyrites than the infinitesimal proportion usual in such rocks. Test-pieces, broken with the greatest care from the center of large blocks, so as to give perfectly fresh fractured surfaces, and to be free from open joints and quartz veins (even microscopic ones), were crushed and washed in porcelain vessels to avoid all possibility of any foreign admixture. Under these circumstances samples of the size of a butternut were generally found sufficient to give distinct colors of gold in very fine, but often beautifully crystallized granules.

The heavy residue was composed principally of zircon, in beautifully sharp and splendent crystals, showing no signs of wear—a character which confirmed the supposed granitic origin of the rock. The iron oxides, magnetite and ilmenite, which usually occur in such rocks, were unusually scanty in amount; and no pyrite, either fresh or altered to limonite, could be detected under the microscope. The amount of gold in the specimens examined was calculated at from 5 to 10 grammes per metric ton; but from the extent of the old workings it is evident that much richer rock occurs in the district, which at one time rivalled in production the more celebrated auriferous districts of the same State, which are characterized by sulphide ores. This mode of occurrence, independent of sulphides, and more or less independent of quartz-veins as well, seems to predominate throughout the district.

Gold in Granitic Apophyses.—Aside from the well-known example of the Passagem Lode, so minutely studied by Dr. Hussak, a number of others of somewhat different character occurring in the same range have been briefly discussed by the writer in the *American Journal of Science.* These, having the appearance of ordinary quartz-veins, are characterized by included patches of kaolinized feldspar, or of mica, carrying one or more of the characteristic granitic accessories, zircon, monazite and xenotime, and are evidently extreme phases of granitic (pegmatitic) dikes and stringers. Throughout the Diamantina District it is rare to see an outcrop of these veins which does not show signs of having been worked, or at least prospected, for gold. The only one examined that is certainly gold-bearing was close to the great diamond-working of Saõ Joâo da Chapada, in which a fine example of the quartz-koalin type is presented. This cuts a somewhat sheared diabase, and consists of vein-quartz of the ordinary aspect, with partings and patches of green muscovite, which give an abundant residue of rutile and monazite. A lode which has been quite extensively worked at Bandeirinha, some 20 miles to the southward, is believed to be of this character, since the concentrated sand gives an abundance of beautifully fresh monazite of the peculiar prismatic type. Unfortunately, this mine could not be examined.

Gold in Lodes of Sulphides and Carbonates.—The

*Abstract of a paper read at the Philadelphia meeting, American Institute of Mining Engineers, May, 1902.

great mine of Morro Velho, in the Sabará District of Minas Geraes, an excellent account of which will be found in the ENGINEERING AND MINING JOURNAL of October 19, 1901, is of this character, as are also the adjacent mine of Raposos and that of Cuyabá (at least as regards its main lode), some 10 miles distant. All these belong to the St. John del Rey Mining Company. The sulphides are pyrite, pyrrhotite, arsenopyrite and chalcopyrite—zincblende and galena occurring only as great rarities. The gangue is a finely granular mixture of carbonates of iron, magnesia and lime (siderite, dolomite and calcite apparently in this order of abundance), with quartz and apparently also a feldspar, albite, which in the mass of the ore is distinguishable with difficulty from the quartz, but appears in great perfection and beauty in the vugs. Typical vein-quartz occurs only in subordinate amounts and local developments.

The country-rock at all three mines is a highly sheared calcschist, which, on account of the development of micaceous or chloritic elements, has generally been taken for a micaceous schist, and in which it is interesting to note that the predominant carbonate is that of lime—those of magnesia and iron being very subordinate in amount, if not entirely absent. The gold-tenor runs about 12 to 20 grammes per ton at Paposos and Cuyabá, and about twice as much at Morro Velho. The lodes are characterized by great size, particularly in width, that of Morro Velho, which has been more fully opened up, having been worked for about 600 ft. in length with a very uniform cross-section, having a mean width of about 45 feet to the depth of more than a mile on the dip, or 3,100 feet vertically below the shaft mouth.

According to notes kindly furnished from a considerable series of analyses by Mr. Wilder, the chief metallurgist at Morro Velho, the ore contains 30 to 40 per cent of sulphides, 30 to 40 of carbonates, and 20 to 30 of quartz. Pyrrhotite is the predominant sulphide; siderite the predominant carbonate. In an assay sample, representing the ore put into the bins during a period of several months, the pyrrhotite was determined by Mr. Wilder at 28.5 per cent. The other sulphides were calculated as follows: arsenopyrite, 5.04; pyrite, 2.50; chalcopyrite, 0.66 per cent, giving 36.70 per cent for the total sulphides. In this sample the residue insoluble in acids (mainly quartz) amounted to 24.10, leaving 39.20 per cent for the carbonates. In the lean portions of the ore the carbonates increase in proportion at the expense of both the sulphides and the quartz; and the miners consider that a fair amount of silica, shown by small, scattered eyes of smoky qaurtz, is a favorable indication of good ore. When, however, the quartz becomes excessive and the lode-stuff takes on the appearance of ordinary vein-quartz, the contents in sulphides and gold run low. Also, when the pyrite runs high, the gold-value seems to sink.

To test the prevailing impression that an abundance of arsenopyrite is a favorable indication for gold-value, Mr. Wilder constructed the gold and arsenic-curves of a large number of assays, with the result that he found divergences quite as frequent as coincidences.

A certain proper mixture of the various sulphides and of the carbonates and quartz of the gangue seems to give the best values. A thin line, characterized by lead sulphide, gave most extraordinary values; but it soon ran out, and no other like it has been known within the experience of the present staff.

At Morro Velho the ore, except as to variations in the relative amounts of the various constituents, presents no well-marked differences in structure and composition throughout the immense mass. At the other two mines, a considerable part of the lodes is constituted by an exceedingly hard, jaspery mixture of carbonate and quartz, banded black-and-white, and comparatively free from sulphides, which envelopes the mass of structureless, workable ore, and is known as *caco* (potsherds), by reason of its somewhat slatey character. Except for its banded structure, and the presence of a certain amount of graphitic matter, this material shows nothing in microscopic sections to distinguish it from the leaner portions of the Morro Velho ore. Graphite occurs in the Morro Velho lode also, but is there confined to a slicken-sided zone on the contact of the eastern end of the lode with the country-rock. This zone, known as "the slide," has been a constant feature from the surface down to the bottom of the present workings, and recalls a somewhat similar zone, also graphite, described by Hussak, in the Passagem Mine.

A singular feature, now appearing in one part of the Cuyabá lode, is a considerable mass of a coarse-grained greenish rock of granite texture, composed essentially of plagioclase feldspar, thickly sprinkled with arsenopyrite, and showing irregular fracture-zones, filled with green chlorite. This mass, which carries a little zincblende, occurs in the width of the better ore, with which it appears to have a genetic connection. This also recalls a feature of the Passagem lode.

Feldspar, in the form of beautiful crystals of albite, is common in the vug-linings at Morro Velho, and is evidently a constituent of the gangue as well, though, owing to the fineness of the grain and the absence of observable twinning, it is distinguishable with difficulty from the quartz. A test-sample freed, as far as practicable, from soluble and heavy constituents by means of acids and a heavy solution of such specific gravity as barely to float quartz, gave alumina and soda corresponding to nearly half of the residue thus purified.

Small proportions of titanium, iron, magnesia, potash and lime, in this analysis, indicate the presence in the ore of other minerals, which, for lack of time, have not been identified. A large water-filled vug was recently struck in the lowest level of the Morro Velho Mine, under circumstances which indicate that it was most probably a sealed flask, containing original lode-water. The walls of the vug presented, instead of the usual lining of beautiful crystallizations of carbonates, quartz, sulphides and albite, a thin earthy coating of gelatinous silica with calcite, and an easily soluble foliated iron silicate (non-tronite?). On dissolving these elements, extremely minute cubes of pyrite and irregular magnetic grains of pyrrhotite were obtained. The water, contains, in the form of silica, carbonates and sulphates, a residue of the elements from which this coating was derived, and—with the possible exception of arsenic and gold—all the elements of the lode itself.

This type of ore-body, exemplified by the Morro Velho lode, presents the following characteristics, which must be considered in any discussion regarding its mode of origin:

1. Notable width, combined with a lenticular or stock-like form of the cross-section.
2. Notable constancy in form, mineral composition and bullion-value, throughout a great length of lode.
3. The predominance of carbonates in the gangue and of pyrrhotite among the sulphides.
4. The presence of a feldspar in the gangue.
5. The presence of free carbon, either disseminated throughout the ore or segregated in zones of movement.
6. The presence of confined mine-water, containing in solution all, or nearly all, the chemical elements of the ore-body, and forming by secondary deposition all, or nearly all, of its characteristic minerals.
7. The absence in the ore-body, and in the country-rock immediately adjoining it, of well-characterized eruptive rocks, unless the peculiar type of feldspar rock of the Cuyabá lode can be taken as such.

ZINC ORE PRODUCTION IN NEW JERSEY.—The report of the State Geologist of New Jersey gives the production of zinc ore in 1901 at 191,220 tons, against 194,881 tons in 1900, and 154,447 tons in 1899. All of this ore was from the New Jersey Zinc Company's mines at Franklin, in Sussex County.

PIG IRON PRODUCTION IN 1902.

The American Iron and Steel Association has received from the manufacturers complete statistics of the production of all kinds of pig iron in the United States in the first half of 1902; also complete statistics of the stocks of pig iron which were on hand and for sale on June 30, 1902. It is a gratification to be able to state that every manufacturer of pig iron in the country, without a single exception, has responded to the Association's request for information. Some comments on these statistics will be found on another page.

The production of pig iron, classified by fuels used, was as follows:

	1901.		1902.
	First half.	Second half.	First half.
Coke and bituminous	6,597,379	7,185,007	7,882,732
Anthracite and coke	865,024	847,503	733,740
Charcoal and coke	17,979	5,315	6,004
Charcoal	194,231	165,916	186,098
Totals	7,674,613	8,203,741	8,808,574

The production of all classes of pig, by States, was as follows, in long tons:

	1901.		1902.
	First half.	Second half.	First half.
Massachusetts	1,952	1,434	1,716
Connecticut	4,621	3,821	5,278
New York	109,317	174,345	186,523
New Jersey	65,524	90,222	105,295
Pennsylvania	3,549,148	3,794,109	4,045,965
Maryland	157,628	145,558	148,619
Virginia	217,819	230,843	263,233
No. Carolina & Georgia	15,547	11,786	12,401
Alabama	627,214	597,998	700,546
Texas	1,320	953	1,528
West Virginia	74,630	91,967	93,297
Kentucky	26,361	42,101	51,089
Tennessee	178,244	158,895	187,359
Ohio	1,598,850	1,727,575	1,775,496
Illinois	739,409	857,441	879,800
Michigan	93,981	76,781	85,661
Wisconsin & Minnesota	124,273	83,278	131,531
Missouri, Colorado, Oregon and Washington	88,775	114,634	133,237
Total	7,674,613	8,203,741	8,808,574

The Association's statistics of unsold stocks do not include pig iron sold and not removed from the furnace bank, or pig iron manufactured by rolling-mill owners for their own use, or pig iron in the hands of consumers. The stocks which were unsold in the hands of manufacturers or their agents on June 30, 1902, amounted to 29,861 tons, against 70,647 tons on December 31, 1901, and 372,560 tons on June 30, 1901. In addition to the 29,861 tons above mentioned the American Pig Iron Storage Warrant Company had in its yards on June 30, 1902, 1,000 tons of pig iron, of which 800 tons were coke and 200 tons were charcoal pig iron. The manufacturers had parted with the control of this 1,000 tons. The record never before showed such small stocks of unsold pig iron as the figures for June 30 represent.

The whole number of furnaces in blast on June 30, 1902, was 286, against 266 on December 31, 1901, and 259 on June 30, 1901. The number idle on June 30, 1902, was 125.

On June 30 there were 28 blast furnaces in course of erection in the United States, of which 24 will use coke for fuel when completed, 2 will use anthracite coal and coke mixed, and 2 will use charcoal. These furnaces are located in the following States: New York, 4 coke; New Jersey, 1 anthracite and coke; Pennsylvania 11, of which 1 in the Lehigh Valley will use anthracite and coke, and 6 in Allegheny County, 1 in the Shenango Valley, and 3 in other counties in Western Pennsylvania will use coke exclusively; Virginia, 1 coke; West Virginia, 1 coke; Tennessee, 1 charcoal; Alabama, 2 coke; Ohio, 2 coke, 1 at Cleveland and 1 at Toledo; Illinois, 1 coke; Michigan, 1 coke and 1 charcoal; and Colorado, 2 coke. A few of these furnaces will be completed and blown in before the close of 1902, but the majority will not be ready for blast until 1903. In addition to the new furnaces enumerated above several coke furnaces are projected and a number of old furnaces are to be rebuilt during 1902 and 1903.

The production of pig iron in 1901 with anthracite and mixed anthracite coal and coke was 1,712,527 tons, or less than one-ninth of the total production, and of the entire anthracite and mixed anthracite coal and coke production of the year only 43,719 tons were made with anthracite alone. The production of pig iron with anthracite and mixed anthracite and coke in the first six months of 1902 amounted to 733,740 tons, against 847,503 tons in the second half of

1901, and the production with anthracite alone amounted to 15,990 tons. These figures, reinforcing those above given for 1901, and in the face of an immense total production of pig iron in the first six months of 1902, show that this country can get along without anthracite coal in its blast furnaces, although it will fare better with it. Coke is now being wholly substituted for mixed anthracite and coke in a number of furnaces which have hitherto used the mixed fuel.

A NEW DEPARTURE IN MANGANESE MINING.

By J. S. C. WELLS, PH. D.

At the old Crimora manganese mine, in Augusta County, Virginia, a novel method of mining the ore is being used. Instead of the old way, with shafts and drifts, the ore is now being washed out by hydraulic methods similar to those used for gold.

CRIMORA MANGANESE MINES. FACE OF BANK. UPPER LAYER GROUND, LOWER CLAY.

The deposit occurs in a deep basin in quartzite and, as shown by test-holes, has a depth of 250 feet at its deepest point, and is said to be ¾-mile long by ½-mile wide. This basin is filled with a stiff clay overlaid by gravel, and the ore is found in the clay in irregular detached masses of varying size. The ore is of high grade, averaging 50 per cent, or over, of manganese.

This mine was worked for several years by the Carnegie Steel Company. The method employed was by shafts and drifts, the deepest workings being 150 feet. This plan required a great deal of timbering, as much as 150,000 to 200,000 feet per month being used, and as shown by the work done since a large amount of ore was left behind. The first time I visited the mine this was very plainly shown where some of the old drifts had been uncovered. Large masses of ore were visible that had been passed by, although within two or three feet of the workings. In another place, where a test-hole had been sunk, it went within a few inches of a body of ore, missing it altogether. It would seem that a free use of an augur hand drill would have proved very useful in testing the ground on each side of the drifts and would have disclosed many bodies of ore that were left untouched.

In the method now in use the covering of wash and gravel is first removed by loading into cars and hauling away. The clay bank is then washed down by water under a head of 275 feet, using a 2-inch nozzle, and the waste runs off through a short tunnel at the lowest point of the pit. It is surprising to see how quickly the heavy stiff clay breaks down and disintegrates under the stream of water. The ore washed comparatively clean in this way is gathered up in wheel-barrows and wheeled to the mill, which is located on the edge of the pit, as shown in the illustration. It is there dumped into a chute, from which it is loaded into skips, which carry it to the large crusher at the top of the building; from the crusher it goes to the washer, and then to the screens, all under ½ inch, passing to the jigs, and over that size to a belt-picking table, where the large pieces of waste are removed. Some of the pieces of ore still hold considerable clay in the cracks and joints, and these are picked out and passed back to a small crusher, the product from which goes to the jigs. Mr. Hannan, the manager, informs me that later on he intends running another tunnel that will tap the deposit at its lowest point, thus enabling him to work out the entire basin. The length of this tunnel will be about 4,500 feet, the greater part being through clay. There is, however, a large area that can be worked through the present tunnel. The production at present is about 50 tons per day.

CRIMORA MANGANESE MINE. PART OF CLAY BED WHICH HAS BEEN WASHED OUT.

Of the two photographs reproduced herewith, No. 1 shows part of the clay-bed that has been washed out; in the background the line of demarcation between the overlying gravel and the clay is clearly shown. No. 2 shows the face of the bank, the upper layer being gravel and the lower one the clay containing the ore. The remains of the old drift are shown to the left of the center.

AMERICAN EXPORT TRADE.

The activity following the conclusion of the war in South Africa presents opportunities of which our manufacturers are taking advantage. American firms have already some good-sized orders for machinery and supplies for the Witwatersrand mines. An advantage is found at present in the competition between steamship lines by which ocean freights have been cut to 10s. from New York to Natal, a rate considerably lower than can be quoted from a British port.

Mines in Cape Colony and on the Gold Coast, in West Africa, have also placed orders here. A short time ago a large gold dredging outfit was shipped from a San Francisco works to the Aukobra-Taqua & Abossa Development Company, a London corporation prospecting on the Aukobra River in the Axim District, on the Gold Coast. Recently the Indwe Coal and Land Company, in the Cape Colony, purchased some large compound engines for driving a general power plant at its mines.

For Japan orders taken recently include a lot of machine tools, and steel for the Japanese navy. Freight rates are high, however,

Experiments are being made with Chanda coal at the Glassport, Pa., by-product coke plant, and if successful similar works will be erected in India. Such an order would be of much interest since the by-product coke oven is much more prominent in Germany than here.

Australia and New Zealand are taking their share of American goods. Recent shipments include some structural material, and some rails have been sent to Auckland, N. Z., for the electric traction system.

An exhibition of American machine tools, etc., is being held at the Crystal Palace, near London. Among orders recently placed for Great Britain was one for coal conveying machinery for Scotland.

For Spain a water power plant has been ordered, to be erected near Barcelona, and a shipment of American locomotives has recently been made for a coal railroad in Bilbao.

Russian concerns are negotiating for American automatic stokers.

From Mexico manufacturers report considerable orders. Recently considerable electric and steam hoisting machinery has been ordered, and in the State of Guadalajara a silver-lead smelting plant with roasting furnaces will be erected by an American manufacturer. There have also been numerous small orders, especially for repairing and enlarging metallurgical plants.

NOTES FROM A LITTLE JOURNEY TO MEXICO.

BY ROBERT T. HILL.

One who, as does the writer, visits Northern Mexico at intervals, cannot but marvel at the remarkable growth and developments constantly taking place in a country which on the surface is apparently a hopeless desert. Each year it yields some new surprise, and the productivity possible from the energy of the people seems almost unlimited. The writer has recently returned from a flying business trip through Northern Mexico, and ventures to submit to the ENGINEERING AND MINING JOURNAL a few observations which will illustrate the rapid progress of this region.

At El Paso it was gratifying to learn of the excellent progress made in the reconstruction of the plant of the American Smelting and Refining Company, which was being consumed by flames as I departed from that city on the fifth of July last year. The newly constructed smelter has an increased capacity of 10,000 tons, and will give employment to 2,000 people. The little suburban village which has grown up around the smelter contains 3,500 people, although the families of most of the employees live within the city limits. The new plant has seven lead and two copper stacks. The whole Southwestern mining country, which is so dependent upon this great institution, had been anxiously awaiting the blowing in of the four furnaces, which took place early in April. The burning of the El Paso smelter was a serious blow to hundreds of mines within a radius of 50 miles of El Paso, and caused nearly eight months' idleness, and now that the welcome "returns" will begin to flow into the mine owners' pockets again, renewed prosperity may be looked for.

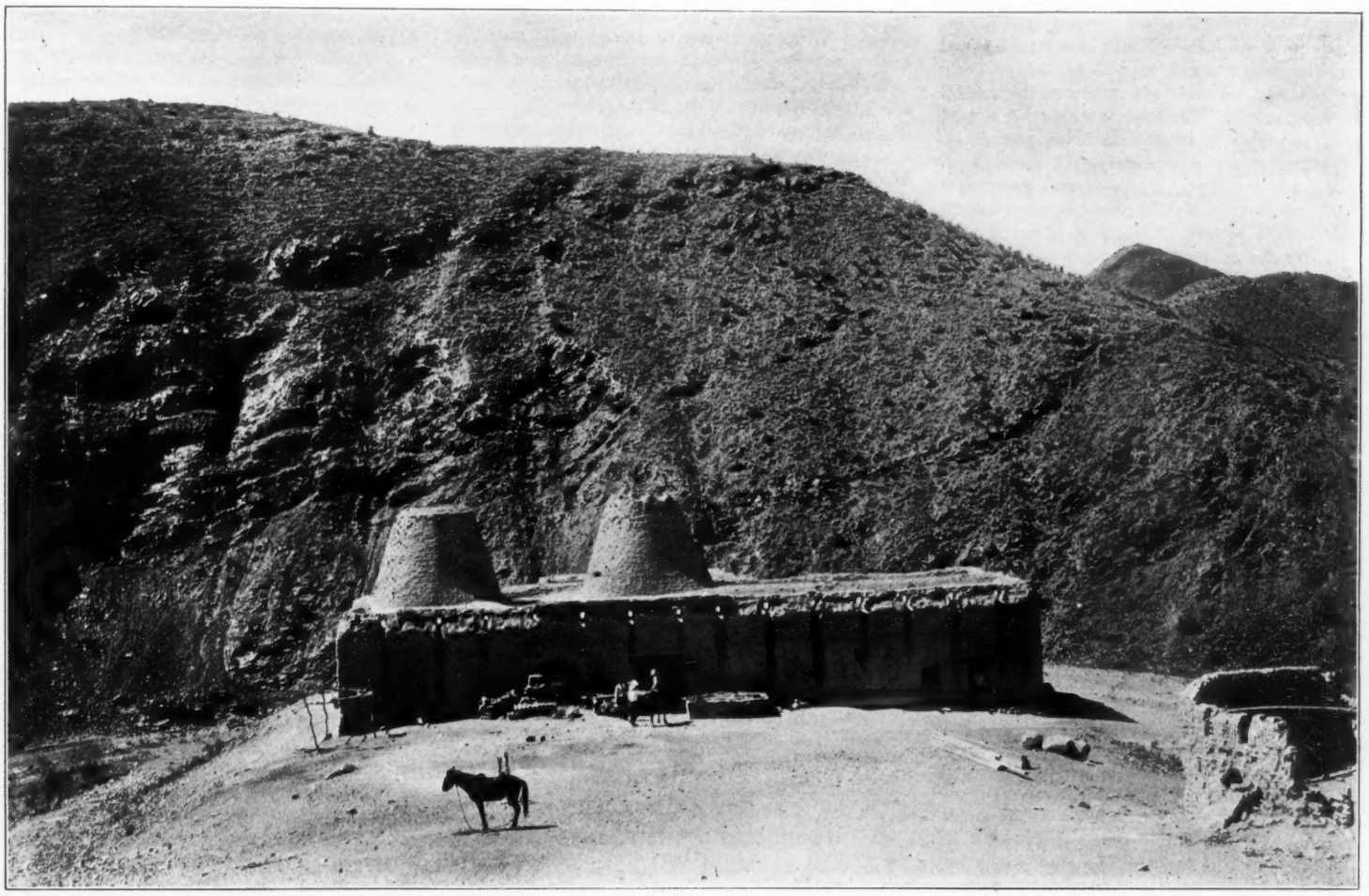
At Torreon, the new smelter, which has been in the course of construction for the past year at that place, was visited. This plant is now completed, and ores, fuel and fluxes were accumulated preparatory to blowing in, and no doubt the smelter is in full operation by this time. This plant has been constructed on the most modern lines, and it is said that the company of Torreon gentlemen who own it have mines enough to supply it with ore, although it is in the field as a competitor with the American Smelting and Refining Company's plants at El Paso, Monterey and Aguas Calientes.

The new steel plant at Monterey is rapidly progressing. Incidentally, it may also be noted that a new 50-ton smelter was recently blown in at the Terlingua, Texas, quicksilver mines, and that the converters at Cananea were to have been ready by April 15. With the great accessions to the number of smelters and iron furnaces, the desert mining industries cannot help but develop a great impetus during the coming months.

Another factor which is adding prosperity to the Southwestern mining industry has been the progress in railway construction during the past six months. The Rock Island Railway has completed its road into El Paso, thus giving another outlet in competition with the Southern Pacific and Santa Fe systems. Work on the Phelps-Dodge Company's system of railway from El Paso to Bisbee is rapidly progressing. The Frisco Railway is expected soon to make another outlet for Northern Mexico, and is surveying from Brownwood, Texas, via Eagle Pass, to Monterey. Another line of railway is being constructed from Saltillo to Torreon. The Stillwell road, which has been projected on such gigantic lines to run from Kansas City to Topolobampo, on the Pacific coast of Mexico, has also apparently received an impetus of fresh capital, and it is believed that it will be actually constructed within an early date. This road, which will enter Mexico by Presidio del Norte, will open up between the latter place and Chihuahua, and between Chihuahua and the Pacific, great areas of mining country hitherto unavailable.

The present activities in transportation and smelting show that capital is appreciating the value of the mineral resources of the great American Desert, which is rapidly becoming the site of a tremendous mining activity.

During the suspension of the smelting plant at El Paso, many of the silver mines of Northern Mexico were dormant, the owners devoting their attention to development rather than production. I found at Santa Eulalia, however, that considerable production was going on, and that shipments were expected to be resumed on the first of April. At Parral, the other great silver camp of Chihuahua, the marvelous is always happening, the latest wonder being the shipment from Palmillas mine of 60 tons of ore to Monterey which netted the owner, Pedro Alvarado, $660,000 Mexican. The story of this man, who but a short time ago was a peon laborer in sandals, is one of the Aladdin-like happenings which strain our credulity. Having attained prosperity, it is said that he has shown an eccentric benevolence which would fill many interesting pages. It is rumored that he has begged of President Diaz the privilege of paying off the National debt, and it is a well known fact, that having once been a laborer himself, he gives employment to every one who applies at his hospitable door. It is even rumored that the pickings of rich earth from his mine, from which he never received the returns, amount to many thousands of dollars a day.



PRIMITIVE ADOBE COPPER MATTE SMELTER, HATHAWAY MINE, NEAR CHORERA, MEXICO.

At Chihuahua I made a complete topographical and geological study of the Santa Eulalia mining district, together with many excellent photographic views, with the expectation of preparing an article upon this interesting camp, which, although having been a producer for over 200 years, has never been adequately described. Unfortunately the notes, maps and photographic plates, after being carefully guarded in my personal baggage, were all burned in a railway wreck which overtook me upon my return journey within a hundred miles of home.

From Chihuahua I made a hasty but most interesting journey 90 miles eastward to Rio Conchos into a region, which so far as geological information is concerned, is a nuevo mondo, although as usual the American miner was found implanted upon the ground. In this region, in the heart of a great district which upon the maps is ordinarily regarded as a great plain of the Bolson de Mapimi, was found a series of rugged anticlinal mountain ranges of

Jurassic and Cretaceous strata accompanied by vast dikes and other forms of igneous rocks.

At Santo Domingo, on the Conchos River, I was hospitably entertained by Messrs. Rickard and Kirtland, who, as agents of the Venture Company of London, had dragged over the waterless desert one of the most complete and perfect steam plants for the washing of the rich placers of that vicinity anywhere to be found, consisting of pumps, pipe lines, steam shovels, concentrators, etc. This plant was just about ready to commence operation upon the rich gravel of that vicinity, and it is to be hoped that a golden harvest will reward men who have had the strength and pluck to carry out this enterprise.

In this region there are many siliceous dikes cutting the vertical Jurassic layers, and at Guadalupe, 45 miles from Santo Domingo, there were several rich beds of quartz gold, the owners of which, however, were impeded by lack of fuel.

Eighteen miles south from Santo Domingo, I found a remarkably interesting copper mine, the property of Mr. Hathaway, which has been worked in a small way for many years. The ores of this mine consist of sulphides occurrring in two small but continuous veins rising through a vertically stratified plane. Many years ago the copper of these mines was converted into matte by means of primitive open hearth adobe furnaces, a picture of which is herewith submitted. Later the ores were concentrated, and until the recent drop in the price of copper were shipped at a profit to the smelter at Aguas Calientes some 600 miles distant.

The Stilwell road will probably run near this Santo Domingo district, and undoubtedly it will be heard from in the future as an important producer of gold and copper.

While at Chihuahua it was announced in the local press that the American Smelting and Refining Company had ordered the closing down of the great Sierra Mojada lead camp for an indefinite period. The reason for this as rumored was the low price of lead, it being alleged that the smelting company was long on that metal at the time, and hoped to increase its price by restriction of production.

The Sonoran province of Mexico, which includes our own Arizona, is undoubtedly one of the greatest copper districts of the world. Its pre-eminence is so great as to overshadow other copper occurrences in Mexico. On the other hand, the Chihuahua province has hitherto been looked upon chiefly as a producer of gold and silver, and the writer has been somewhat surprised at the number and diversity of copper localities in it. No less than a dozen small copper mines have come under my observation in Chihuahua, San Luis Potosi and Durango, which indicate that the region may ultimately prove a considerable contributor to the copper supply. One of these localities on the Conchos I have already described. Nearer the mouth of that river is another mine known as Las Vegas, which will ultimately prove a producer upon the arrival of railway facilities. These and the Hathaway mine are sheet veins arising through the perpendicular strata of a Jurassic and Cretaceous age.

Mr. Clifford, of El Paso, the well known mining man, has been shipping considerable ore from a mine near Magdalena, about midway between El Paso and Chihuahua. Farther south on the Mexican Central Railway, at Jimulco, near the Durango-Coahuila line, is an interesting copper mine in which the oxide and carbonate ores occur in veins and replacement pockets in the Comanche (Edwards) limestone. The mine has produced nearly $100,000 worth of copper in the past year. Near El Salado, on the northern edge of San Luis Potosi, there is another copper mine owned by some Italian gentlemen, which has been a steady shipper during the past year.

Still farther north, between Monclova and Lampazos, there is another copper mine which is shipping sulphide concentrates, while it is rumored that beneath the tremendous iron capping of Candella a great deposit of copper has been recently found. In none of these copper mines of the Chihuahua province has there been a deep development, and they are not now of great importance.

ZINC PRODUCTION IN 1901.

The production and consumption of spelter, or metallic zinc, in the United States for 1901 is reported by Mr. Charles Kirchhoff for the United States Geological Survey as follows, in short tons of 2,000 pounds; the figures being compared with those for 1900:

	1900.	1901.	Changes.
Production	123,886	140,822	I. 16,936
Exports	22,410	3,390	D. 19,020
Estimated consumption	99,445	141,697	I. 42,252
Total	121,855	145,087	I. 23,232
Decrease in stocks	.....	4,265	....
Increase in stocks	3,015	....	....

The increase in production in 1901 was 13.7 per cent. The decrease in exports was 84.9 per cent. As heretofore, the exports went chiefly to the United Kingdom, the quantity being 5,167,274 pounds for 1901, as compared with 33,378,240 in 1900.

The year 1901 was one of prosperity for the zinc mining industry of Southwest Missouri and Southeast Kansas, which district maintains its position. The production of zinc ore in the Galena-Joplin District in 1901 was 256,920 short tons, valued at $6,318,249, as compared with 244,629 short tons, valued at $6,583,944, in 1900; an increase for 1901 in quantity of 12,291 short tons, but a decrease in value of $265,695.

The imports of zinc in 1901 amounted in value to $76,059, as compared with $128,090 in 1900, and with $165,667 in 1899.

The world's production of zinc in 1901 is estimated at 501,494 long tons, as compared with 470,937 long tons in 1900, and with 481,854 long tons in 1899. The United States furnished last year 25.1 per cent of the world's production. The largest producer in the world is the Vieille Montague Company in Belgium, which has the record of 72,330 long tons in 1901, as compared with 68,815 in 1900. The Lanyon Zinc Company, of Kansas, would take rank as the second largest producing company in the world, the next three largest makers being in Silesia.

Zinc White.—The production of zinc white from ores in 1901 amounted to 38,889 short tons, against 47,151 tons total output in 1900. A new manufactory was started at West Plains, Missouri, in December, by the Renfrew Zinc Oxide Company, and the plant of the Ozark Zinc Oxide Company, at Joplin, Missouri, was building, though not yet completed at the close of the year. Each of these is to have an estimated capacity of about 2,000 tons of oxide per annum.

PRODUCTION OF MANGANESE.

The total production of manganese ores in the United States during the year 1901, as reported to the Geological Survey by Mr. John Birkinbine, amounted to 11,995 long tons, valued at $116,722, as compared with 11,711 long tons, valued at $100,289, in 1900. The increase of the production of 1901 was only 224 tons or about two per cent. but the average value per ton increased from $8.52 in 1900 to $9.73 in 1901 or $1.21 per ton.

In 1901 eight States contributed to the total, Alabama, Missouri and Utah being added to the 1900 list. Montana, a former producer, reported no ore mined. As in 1900, Virginia heads the list of production, Georgia being second and Utah ranking third; the combined product of which three States amounted to 10,849 tons, or 90 per cent of the total for the United States. At no time since 1891 has the annual production of manganese ores exceeded 16,000 long tons, which suggests that the domestic manganese industry has not developed into one of importance as far as quantity is concerned. The bulk of the supply still comes from foreign countries.

The amount of manganese ores imported in the United States during the year 1901 was 165,722 long tons, valued at $1,486,573, or $8.97 per ton, as compared with imports of 256,252 long tons, valued at $2,042,361 or $7.97 per ton, in 1900. The United States is the largest producer of steel in the world, and in the production of this steel a large amount of ferro-manganese and spiegeleisen is used. In 1901 the foreign ferro and spiegel were attractively low in price so that a number of the largest companies preferred to import such manganese metal as might be required rather than to manufacture it. This will account for the falling off in imports of manganese ores in 1901.

The principal shippers to the United States in 1901 were Brazil, Russia, Cuba, Turkey, Chile and India, in the order named. The importation by customs districts shows that over half of the total foreign manganese ore was received at the port of Baltimore and about one-seventh at Philadelphia. The average domestic production for thirteen years was 13,949 long tons, valued at $125,773, and the average imports in the same period amounted annually to 92,413 long tons, valued at $853,627. Manganese ore to the amount of 21,627 long tons was imported in the United States from Cuba in 1901, and it is probable that Cuba will continue to be an important source of supply of manganese ores of the United States. The Russian Empire is the largest contributor of manganese ores, nearly all the world's output being credited to that country. The greatest portion of this ore comes from the Caucasus district, followed in order by South Russia and the Ural districts. The imports in the United States from Russia in 1901 amounted to 32,600 long tons. According to the latest obtainable figures the production of manganese ore for 1901 may be estimated for the most important producing countries as follows: Russia, 646,582 long tons; India, 130,670 long tons; Brazil, 95,710 long tons; Spain, 90,224 long tons; Germany, 58,269 long tons; Turkey, 38,100 long tons; Chile, 31,477 long tons, and Cuba, 25,183 long tons.

THE SICILIAN BRIMSTONE TRADE.

Specially Contributed.

Since the organization of the Anglo-Sicilian Sulphur Company, in which British and Italian capital is largely interested, the brimstone industry of Sicily has become more prosperous. The Anglo-Sicilian Company—otherwise known as the sulphur trust,—is in control of fully 85 per cent of the brimstone production of Sicily, as the result of a long time agreement with the miners. The company has a capital of less than $3,500,000, upon which it has paid in 5 years to 1901 dividends of 43¾ per cent. It is said that the profits from the sale of sulphur at ruling prices are large; but on the other hand it takes considerable money to carry the heavy stocks of brimstone now on hand. The financial standing of the syndicate is strong, and there seems little doubt a change in the business policy will be made before the renewal agreement with producers comes up some time hence. In the meantime there is competition with the outside operators, who produce about 15 per cent of the brimstone. Occasionally the syndicate meets them with a small reduction in price.

The monthly exports of brimstone from Sicilian ports from January to May, inclusive, compare with last year as follows, in long tons of 2,240 pounds:

Month.	1901.	1902.	Changes.
January	32,594	41,692	I. 9,098
February	45,471	40,221	D. 5,250
March	67,638	54,263	D. 13,375
April	66 776	58,346	D. 8,430
May	42,713	37,089	D. 5,624
Total	255,192	231,611	D. 23,581
U. S Imports	63,189	79,604	I. 16,415

The decrease in this year's exports is equal to 9.3 per cent; this is due chiefly to the curtailed consumption in France since the termination of the sulphur refiners' agreement with the Sicilian producers some months ago.

The imports into the United States this year have increased about 26 per cent. This is credited wholly to the paper pulp manufacturers, as sulphuric acid makers are now using more pyrites owing to the high prices asked for brimstone.

The stocks of brimstone at shipping ports in Sicily this year are considerably larger than in 1901. On January 1, 1902, the stocks were 310,123 tons, and a month later rose to 315,634 tons, which is the largest in over two years. In March and April

heavy exports reduced the stocks to 251,815 tons on May 1, and on June 1 they were 262,292 tons, which compares with 172,509 tons on June 1, 1901, and 186,290 tons on June 1, 1900. The stocks show conclusively that the syndicate mines are producing a large quantity of brimstone, notwithstanding the curtailment in exports.

On the other hand prices continue to rule high. Below we give the average selling prices, f. o. b. shipping port in Sicily, in the 5 months ending May 31, as compared with the corresponding period last year:

	1901.	1902.	Changes.	
Best unmixed 2ds	$18.72	$20.21	I.	$1.49
Best unmixed 3ds	16.57	17.94	I.	1.37
Current 3ds	....	16.98		.....
Refined block (100%)	19.82	20.63	I.	0.81
Refined roll (casks)	21.57	22.86	I.	1.29
Sublimed flowers pure (bags)	23.59	24.60	I.	1.01
Sublimed flowers, current	22.56	22.67	I.	.11

There has been a marked increase in prices this year, and from present indications the producing syndicate will not deviate from its policy. This, of course, will eventually be decided by the consumption, in which the falling off in the exports of brimstone from Sicily indicates some decrease.

A matter of some importance to shippers is the freight market. During the first three months of this year charters from Sicily to the United States were made at $1.92 to $2.16 per ton, and in April and May at $1.68 to $1.80. Last year during this period the extreme freights to this country were $1.62 and $1.92, showing an advance in 1902 of from 6 to 14 cents. The rates to European ports were also higher.

THE POTASH SALTS INDUSTRY IN GERMANY.

SPECIALLY CONTRIBUTED.

Germany being the only country in which potassium salts have been found in quantity, has a monopoly, selling throughout the world, at fixed prices. Production is large, and steadily growing. Every effort is being made by the larger properties to induce agriculturists to use more potash salts. Much money is being spent in this propaganda, especially by the German Kali Syndicate, which issues well written and illustrated pamphlets, etc., describing the advantages to be derived from a liberal use of potash salts as fertilizers. This syndicate has in its membership about 20 of the best properties, which have a total capitalization of $56,250,000, the shares being widely distributed among investors. Fully one-half of these properties have already proved excellent investments, while the others, now in course of development, are yielding satisfactory profits. To show the magnitude of this business, we give below its shipments during 1900 and 1901, as officially reported, in metric tons of 2,204 pounds:

	1900.	1901.	Changes.	
Potassium chloride, 80%..	191,422	197,474	I.	6,052
Potassium sulphate, 90%,..	31,255	28,159	D.	3,096
Sulph. Pot.-Magnesium, cryst., 40%	882	751	D.	131
Sulph. Pot.-Magnesium, Calc. 48%,	12,150	11,750	D.	400
Kieserite, Calcined	358	361	I.	3
Kieserite, Blocks	28,508	26,727	D.	1,781
Pot. Manure salt, 20-40%	125,089	140,683	I.	15,594
Kainit & Sylvinit	1,099,631	1,347,323	I.	247,692
Carnalite	58,358	85,245	I.	26,887
Total tons	1,547,653	1,838,473	I.	290,820

This table shows that there has been an increase of nearly 19 per cent in the shipments in 1901, due chiefly to the heavy consumption of kainit and manure salt. Of the total shipped in 1901 the United States received 373,245 tons, or 20.3 per cent, as against 314,556 tons, or 20.3 per cent. in 1900, this country being the second largest consumer. The heaviest buyers in this country are the fertilizer combinations, called the Virginia-Carolina Chemical Company, and the American Agricultural Chemical Company. In order to obtain its supply of potash salts the Virginia-Carolina Company recently sent experts to Germany to make proper arrangements, and after buying a promising independent property for a large sum, succeeded in inducing the German Kali Syndicate to make advantageous terms. Now the Virginia-Carolina Company will receive its potash salts at lower prices than others, and it is likely that a similar arrangement will be made with the American Agricultural Chemical Company.

The consumption in Germany last year showed a substantial gain over 1900, owing to the heavy use by the beet sugar growers. In 1901 the shipments of potash salts to German users aggregated 1,069,334 tons, equal to 58.2 per cent of the total sold, which compares with 910,483 tons, or 58.8 per cent in 1900.

Other large buyers in 1901 were France, Great Britain, Norway and Sweden, Denmark, Belgium and Holland. Russia is also consuming larger quantities than formerly, but the total is still too small to receive attention.

Mining is active in nearly every locality where indications warrant the expenditure. Renewed efforts are being made to sink deep shafts, as borings have shown an excellent quality of potash at 3,250 feet. The heavy flow of water at about 1,000 feet and less has prevented the sinking of deep shafts. In fact, considerable money has already been spent in this direction without success. Three of the prominent companies—the Ronnenberg, the Benthe and the Hansa-Silberberg—are sinking deeper shafts. The Benthe-Walmont Company had a shaft down about 850 feet when an inrush of water completely ruined the workings. Boring companies are busy proving ground, and in the Luneburger Heath field very satisfactory work is being done. The Einigkeit, also known as the trade union, near Eallersleben, is drilling, and at a depth of 1,160 feet has struck a layer of potash of first class quality.

As to the future of the industry there is little doubt of its continued prosperity.

COAL MINING MACHINES IN GREAT BRITAIN.

The London *Colliery Guardian* says that the inspectors of mines, in their reports for 1901, give some details as to the use last year of coal-cutting machines in the mines in their districts. A collective examination is somewhat disappointing, for although the number of machines in use has apparently increased, their output has been diminished. No returns are given for the Midland, Newcastle and Southern districts, but apart from these there were 260 machines at work last year, as against 226 in the same districts in 1900, but their total production fell from 2,500,401 tons to 2,216,710 tons. Yorkshire had 85 machines at work as against 83 in the previous year, and the Liverpool District 65 as against 46, but here the production fell from 500,000 tons to 400,000 tons—a very poor return, which prompts the district inspector to remark that "coal-cutting by machinery may have its opportunity when wages are high; with low wages few of the machines now in the market will be able to compete to any great advantage with hand labor." In Scotland, in 1900, there were 45 machines in use (33 in the East and 12 in the West); last year the number rose to 49 (16 in the East and 33 in the West—due probably to the alteration of the boundary between the two districts). Stafford showed an increase of two machines and nearly 40,000 tons, but although in Durham there were six more machines and in the Manchester District one more machine than in the previous year, in both the output therefrom decreased. If the number of machines in the Midland and Newcastle districts be estimated, probably about 340 machines last year in Great Britain were at work.

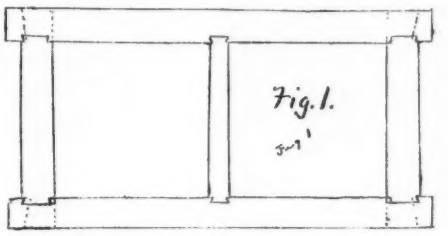
This apparently unfavorable return—so far as output is concerned—is probably to be explained by the comparatively restricted demand for coal last year, which caused many of the machines in the thin seams, which are only profitably worked in good times, to be temporarily laid idle. Thus in regard to Staffordshire, the district inspector says that, while increased attention is being given to coal-cutting by machinery, many of the machines were last last year only partially employed. South Wales continues to taboo the machine in favor of hand labor, but the inspector believes that machines might be advantageously employed in the house coal seams.

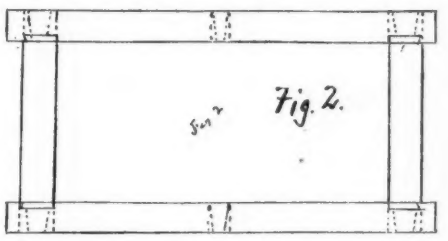
A METHOD OF MINE TIMBERING.

The accompanying sketches illustrate a method of mine timbering used at the shaft of the Mount Shasta Gold Mines Corporation at Mount Shasta, Cal. The sketches and particulars were given by Superintendent Gabbs to *Mineral Wealth of Northern California.*

Square timbers only are used, although round timbers could be framed on the same principle, simply by squaring the ends. In framing the timbers, after ascertaining the size of the opening for the shaft, a set of templets is made to conform to the different cuts, gains, lengths, etc. Each timber is then cut to conform to templet. By this method each timber must necessarily fit in its place, there being no fitting or rather altering when placing in the shaft.

Fig. 1 in the sketch shows a top view of the frame with side-plates, end-plates, and center spreader in place. Dotted lines show the shape of the gains for the corner posts. Fig. 2 is a side elevation of the set, dotted lines showing gains for end plates and spreader, showing posts in place. Fig. 3 shows the manner of framing the corner posts; Fig. 4 the manner of framing end plates, and Fig 5 the way in which the center spreader is framed.





A METHOD OF MINE TIMBERING.

In beginning the timbering the collar is first placed and securely wedged to conform to inclination of shaft. Then each corner post is slipped into place on lower side of side-plate leaving 1½ inches for draw. The posts will sustain themselves. Then slip the side-plates on lower end of posts. Now place end-plates in place and drive home. Then bar or drive corner posts home, binding all together firmly. The shapes of the gains on side plates and the framing on end of posts are such that they will admit the posts 2 inches from inside of side-plate, or just the usual thickness of lagging. It will be at once seen that this manner of framing requires no more room than the old method and is superior inasmuch as it is a self locking frame and can be placed very quickly.

There is never any danger under any circumstances of the sets parting. In fact, the entire set in shaft would hold together were there nothing but a firm collar to sustain it.

PETROLEUM EXPORTS FROM AUSTRIA.—The Austrian refiners of petroleum have effected an organization for export purposes. It is announced that they intend to invade France, Germany, Switzerland and Italy, and wrest those countries, if possible, from the American company which now supplies their demands for petroleum, and that they also propose contesting certain markets with Russia.

THE DETERMINATION OF ARSENIC AND ANTIMONY.

BY LEWIS B. SKINNER AND R. H. HAWLEY, Colorado Springs, Colo.

Several schemes for the determination of arsenic have appeared of late in different chemical journals, showing that some difficulty seems to have been experienced in determining this element and that new and better methods are desired.

Pearce's method has been, and is now, the one usually used in the West for smelter work. In some cases, especially for investigation work, this is not accurate enough. Some arsenic is volatilized on making the fusion, and consequently checks are hard to arrive at in the hands of different chemists, more arsenic being lost under some conditions than others.

After trying various schemes to perfect a short accurate method, we have found that any mixture of sulphides precipitated from an acid solution may be decomposed by a hydrochloric acid solution of cupric chloride and the arsenious chloride distilled out very quickly. Not more than one gram of ore may be conveniently handled by the Pearce method, but with the following method any amount may be used, so that very small percentages may be determined with accuracy.

The solutions required are:

Cupric Chloride.—Dissolve 300 grams of pure cupric chloride crystals in one litre of hydrochloric acid (sp. gr. 1.20). This solution is mixed with one litre of a solution of zinc chloride which boils at 180° C.

The zinc chloride may be made by adding successively to one pound of pure stick zinc 500 c. c. of water and 1,250 c. c. of hydrochloric acid (1.20 sp. gr.). After the zinc is in solution, bring to a boil and evaporate a little to bring the boiling point up to 180° C., this making about 1,100 c. c. of solution.

Standard Iodine Solution.—This is best made so that one c. c. is equivalent to about .005 grams of arsenic. Dissolve about 40 grams of potassium iodine in a minimum of water and to this add 17 grams of iodine. After the iodine is all dissolved, make up to one litre with distilled water.

To standardize, dissolve 300 milligrams of c. p. arsenious acid (AS_2O_3) in a little caustic soda or potash, dilute to about 200 c. c., acidify slightly with hydrochloric acid, add about 2 grams of bicarbonate of soda, some starch solution, and titrate to a permanent blue. The arsenious acid contains 75.76 per cent arsenic.

A check should be made by precipitating with hydrogen sulphide gas, the same amount of arsenic as that used for the standard, filtering off the sulphide of arsenic and distilling as in a regular determination (shown subsequently) and titrating. Deduct from all regular determinations the number of cubic centimeters required over those of the standard. This is necessary on account of the possibility of the reagents containing impurities. It is difficult to obtain cupric chloride free from arsenic. Or, the cupric chloride solution may be put into a flask with a filter paper and about 200 milligrams of c. p. copper, distilled and titrated, and the number of c. c. used deducted from the regular distillations.

The method of procedure on a gram charge, which is the amount usually taken, is as follows:

Add 10 c. c of nitric acid (sp. gr. 1.42) to the ore in a 3-inch diameter casserole and warm. After the evolution of red fumes has nearly ceased add about 10 c. c. sulphuric acid (1.84 sp. gr.) and run down to copious fumes of sulphuric acid. Do not boil too long after dense fumes of sulphuric acid have started or some small amounts of arsenic may be volatilized.

Allow the casserole to cool and add 40 c. c. of cold water and 10 c. c. of hydrochloric acid. Some tartaric acid should be added also, if antimony is to be determined. Boil to dissolve all soluble matter.

If much gangue is present, filter; if not, wash into a No. 3 Griffin lipped beaker, using warm water, and reduce to a colorless solution with a mixture of one part of ammonium bisulphite and two parts of strong ammonia. The reduction is best made by adding the ammoniacal sulphite solution drop by drop with constant stirring, waiting for the precipitate formed to dissolve after each addition. Do not add any more sulphite than that necessary to reduce to colorless stage. Add a little more hydrochloric acid in case the hydrates formed do not dissolve. If there is much gold, selenium or tellurium in the ore, these metals will be precipitated by the excess of sulphurous acid and darken the solution, so, if after the solution is nearly colorless this darkening occurs, no more sulphite need be added.

Boil the solution a few minutes until there is no apparent odor of sulphurous acid and then while still warm pass in a lively current of hydrogen sulphide gas for about fifteen minutes, or until the precipitated particles gather together and the supernatant liquor does not appear murky. It is safer to pass the gas through for a longer period of time, but, in case of hurry, after some experience, the point may be told almost with certainty by inspection.

Filter the precipitated sulphides through a 11 c.m. paper and wash the sulphides all onto the paper with plain water. Wash out the iron salts. Test the filtrate with hydrogen sulphide gas.

Now put the paper containing the sulphides into a four ounce distillation flask, the arm from the neck of which is bent down at the end so as to connect with a twelve-inch Liebig condenser set vertically. If the sulphides are too bulky to wrap in the paper and put into the flask, pierce the point of the filter and wash most of the precipitate through the funnel into the flask, using a minimum wash of one volume of hydrochloric (sp. gr. 1.20) and one volume of water, used in a wash bottle with a Bunsen valve.

Remove the paper and put it into the flask, then pour through the funnel, to wash it, 50 c. c. of the cupric chloride solution. Always pour the chloride solution in through a funnel reaching below the opening at the side of the neck so as to avoid getting copper into the distillate.

A thermometer through a rubber stopper is inserted in the neck of the flask reaching to within about one-fourth of an inch from the bottom. The flask is set on a sand bath, 4 inches in diameter, so that the naked flame shall not play on the sides of the flask, so avoiding the raising of the temperature at any spot above that desired. Allow the outlet of the condenser to dip about one-half inch into about 40 c. c. of cold water in a No. 1 beaker.

Heat the flask gradually until the thermometer reads about 115° C., then remove the stopper and add 10 to 25 c. c. of strong hydrochloric acid, collecting a second distillate in water as before. This second distillation is not necessary if the arsenic is present in small amounts.

The distillates are poured into No. 3 beakers, made alkaline with ammonia, just acidified with hydrochloric acid, cooled, about two grams of bicarbonate of soda and some starch solution added and titrated with standard iodine solution. As a rule not more than a few tenths of a c. c. of the iodine solution will be required for the second distillate where the amount of arsenic is high.

Antimony may now be determined after removing the stopper with the thermometer and inserting another through which is a glass tube reaching nearly to the bottom of the flask and connected with a hydrochloric acid gas generator. This generator contains hydrochloric acid (sp. gr. 1.20) into which sulphuric acid (1.84 sp. gr.) is allowed to drop from a separatory funnel at the rate of about two drops per second.

The condenser is sealed with cold water as for the arsenic distillation and heat is applied to the flask until the mass in the flask becomes about dry. Do not heat to much higher point, as copper chloride is liable to come over. Remove the beaker containing the distillate, add a little tartaric acid, almost neutralize with ammonia and pass in hydrogen sulphide gas. If the orange antimony sulphide precipitate shows up, put under the condenser other beakers of water as seals, keeping up the heating and passing in of the hydrochloric acid gas until no precipitate is formed with hydrogen sulphide.

Filter the sulphide of antimony into a tared Gooch crucible, heat in an air bath at 255° C. for one hour and weigh. The weight multiplied by 71.40 will give the amount of antimony.

It takes about fifteen minutes each for the arsenic and antimony distillations.

Known weights of arsenic and antimony have been mixed with all the metals ordinarily thrown down by the hydrogen sulphide in an acid solution and then run through this scheme. Results were obtained which checked closely the amounts taken. Also a variety of ores on which checks had been obtained by different chemists were run by this method with results which showed an average of about six-tenths of a per cent higher than those by the Pearce method. The presence of molybdenum gives results a little high for the antimony.

In the distillations some uncombined sulphur comes over, but it does not affect the results. No sulphurous acid or hydrogen sulphide will be found with the arsenious chloride distillate. Antimonious chloride cannot be titrated owing to other decompositions from the high temperature required to distil it. Ferric chloride was tried in place of the cupric chloride, but was found to work badly, allowing hydrogen sulphide to come over.

SULPHURIC ACID BY ELECTROLYSIS.—Mr. Clinton Paul Townsend, in the *Electrical World and Engineer,* says:

"Faraday and a host of subsequent experimenters have investigated the electrolytic oxidation of sulphur dioxide in aqueous solution, and have found that under normal conditions one-half the oxide undergoes oxidation to sulphuric acid at the anode, the remainder appearing as sulphur or sulphureted hydrogen at the cathode. In 1895, however, Dr. Leonard Wacker succeeded in rendering the oxidation quantitative by the concurrent use or production of carriers of oxygen, such as the persulphates, or even the halogens. Mr. Charles B. Jacobs now finds that the same result may be accomplished by a judicious application of the principle that oxidation is facilitated by a concentrated solution and low current density at the anode. In Jacobs' apparatus the anode is a porous composition through which the gas is injected in a continuous stream into the cell; and the anode area is 33 times that of the cathode. In the apparatus used the vessel is provided with horizontal electrodes and an interposed diaphragm. The porous anode constitutes a partition near the base of the cell, and into the lower compartment so formed sulphur dioxide is injected through the pipe, passing through the previous anode and undergoing oxidation therein. An outlet is provided for withdrawal of the sulphuric acid when the hydrometer shall indicate that the desired density has been reached. A refrigerating jacket is provided in order that advantage may be taken of the increased solubility of sulphur dioxide at 0° C.

"Jacobs, like Wacker, finds that by continuously injecting sulphur dioxide, the sulphuric acid may be brought to standard concentratioin. While, as stated, the reaction, chemically considered, is quantitative, all of the sulphur dioxide being converted, the electrolytic efficiency is given as 54 per cent; this result is attained with a potential difference of two volts and a current density of 15 to 20 amperes per square foot of anode surface."

LIQUID FUEL FOR STEAMERS.—According to recent English exchanges the Red Star liner *Kensington* has been ordered to the Tyne, where she will be fitted with patent oil-burning furnaces by the Wallsend Slipway and Engineering Company, Limited. Whereas the previous vessels converted into oil burners by this company have been tank steamers, the *Kensington* is a large Atlantic trader, and will be the first vessel of her type that the Wallsend firm has adapted to oil-burning.

THE KAIPING COAL MINES AND COAL-FIELD, CHIHLE PROVINCE, NORTH CHINA.*

BY HERBERT C. HOOVER.

These coal mines, the first successful mines in China, are of considerable interest in that they are the pioneers in mining under the peculiar conditions of China, and will afford in an economic sense no little interest to the mining and industrial world.

Location.—The Kaiping coal-field is located near the Gulf of Pechihle in Chihle Province. The field extends for 23 miles along the Tientsin-Newchwang Railway, and the center of the field is 62 miles by rail from the port of Tongku and 73 miles by rail from the new port of Ching Wan Tow. The proprietors own a canal reaching within 7 miles of the mines, affording, in addition, water transport to seaboard at Tongku, and connecting with the interior canal system of China.

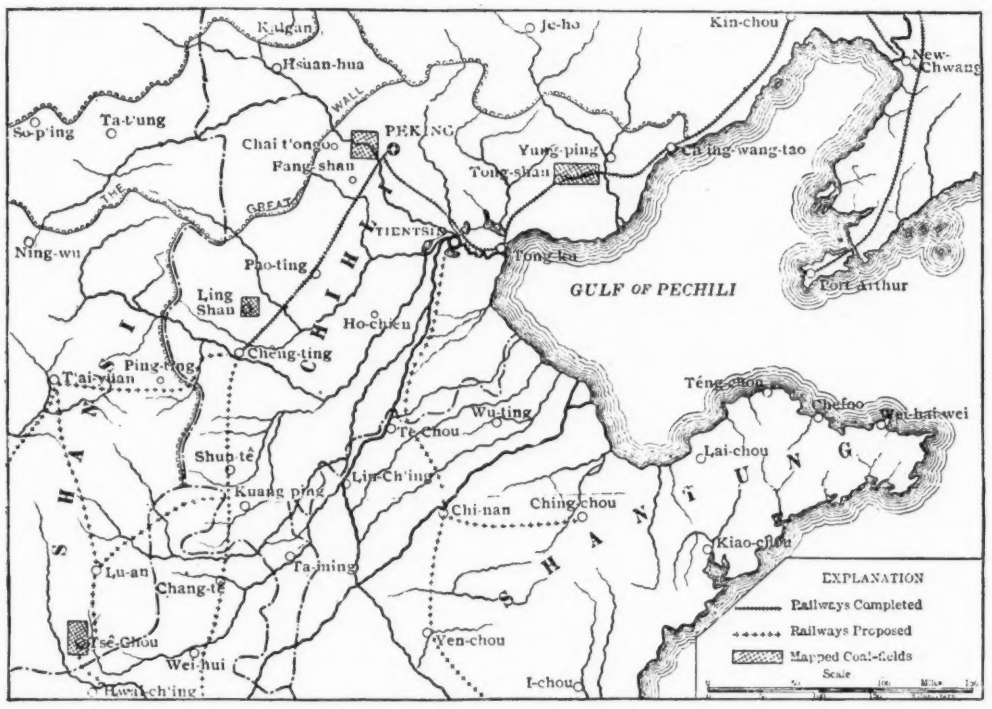
History.—The company was founded in 1878 by Tong King Sing, and through the Viceroy, Li Hung Chang, the right was secured to open mines by foreign methods. The enterprise was purely Chinese, and its foundation marked an era in the progress of China, for not only was it a pioneer in the introduction of Western mining methods, but is an attempt at adaptation of Western financial methods, and too much credit cannot be given to the founders for the creditable manner in which they overcame almost stupendous obstacles of superstition and general obstruction. The company organized was a semi-official character and the Government was to participate in the profits and appoint the directorate. The capital was secured by a share issue, but the shareholders had no voice in the company, and were somewhat on the footing of debenture-holders with variable interest as the directors might decide. However, 12 per cent was paid as a rule, and after this the officers considered that their services warranted the absorption of the remainder. In 1879 a pit was opened at Tong-shan, and in 1889 a second pit was opened at Linse. and in 1894 a third was opened at Hseshan. In 1880 the company constructed a canal from Hsu Ko Chwang, a village 7 miles from Tongshan, to Lutai, a distance of about 15 miles, thus securing connection with the waterways of the interior. In 1885 the first railway in China was built surreptitiously by the foreign employees of the company, first to connect with the head of the canal. It was at first operated with mules, but later an engine was built, and, upon the inhabitants becoming accustomed to that, it was extended to seaboard at Tongku, and was then taken in hand by the Imperial Government, and developed into the Imperial Northern Railway System. Until recently the administration of the company was entirely Chinese, foreigners were employed in advisatory technical capacities, but had absolutely no financial control.

In 1900 the company was transformed into an English company, the Chinese Engineering and Mining Company, Limited, the coal mining rights expanded to cover the entire coal-field, and foreign administration introduced.

The proprietors, have large shipping and wharf interests on the China coast, and are improving the harbor of Ching Wan Tow with a sea-wall, and modern appliances for handling coal, gaining thereby freedom from the winter closure by ice of the harbor at Tongku and a depth of water rendering possible much deeper draft colliers.

The coal production has been in long tons:—

	Tongshan and Hse Shan.	Linse.
From 1881 to 1897 inclusive	4,312,409	730,000
1898	469,921	262,000
1899	528,240	250,000
Total	5,310,570	1,242,000



COAL-FIELDS OF NORTHEASTERN CHINA.

Geology.—A peninsular-shaped range of sub-Carboniferous limestone hills stretches out from the larger ranges in the north of the province, dying out at Tongshan into the great alluvian plain. This promontory forms, roughly, the anxious of a sharp anticlinal fold, and the Coal Measures dip away sharply to the north and south. The two parallel coal basins thus formed are, except for their outcrop along the flanks of this single line of hills, practically buried by the alluvial. The northern outcrop of the southern basin is traceable for a distance of about 23 miles, turning at the "spoon" of the basin east of Linse, and then traceable for a distance of 6 or 7 miles eastward, disappearing under the alluvial. The outcrop of the northern basin is evident in only two places, so closely does the alluvial lie upon the hillsides. The structure of the western or Tongshan end of the field is greatly disturbed by faults, one of the largest cutting the Tongshan Mine off from the rest of the field by a throw of several thousand feet. Eastward of this fault there it little faulting, and the coal has an average dip south of about 45°, along the whole northern side of the southern basin. For the distance that the outcrop can be traced on the south side of the basin, the dip is about 30° north. The average section shows about 800 feet of shales and slates overlying the limestones and made up partly of fire-clays. Upon this there rest the productive Coal Measures, consisting of sandstones, slate, and coal, to a thickness of about 800 feet.

Number and Size of the Coal Seams.—The number and thickness of the seams vary greatly at different points in the field. There are 17 seams known, but none under 2 feet 6 inches are considered workable, and of workable seams there are from 6 to 8. Complete sections of the measures are known at Tongshan, Ma Chia Kou, Wu Shui Chwang, points about equi-distant along the north rim of the southern basin, and they show an average of about 85 feet of workable coal. At Linse on the east end and southern rim of the southern basin, the coal has thinned somewhat and gives but 60 feet. The diamond drill bores were made under foreign supervision. The bores at Pam Pe Tien and Chao Kou Chwang pierce only a portion of the coal series. The correlation of seams cannot be said to be certain.

No. of Seam.	Tong Shan.	Pam Pe Tien.	Ma Chia Kou.	Chao Ko Chwang.	Wu Chui Chwang.	Linse.
	Ft. in.	Ft. in	Ft. in.	Ft. in.	Ft. in.	Ft. in.
3	7 6	*	—	2 2	2 6	*
4	—	*	5 0	—	4 0	*
5	5 6	*	10 6	—	5 0	3 0
6	4 0	*	—	7 8	9 0	2 6
9	9 6	*	2 0	—	2 0	6 0
9	15 0	*	21 0	25 8	8 0	
9½	—	*	2 0	*	2 0	31 0
10	15 0	6 0	26 0	*	11 0	
11	2 6	—	—	*	7 0	4 2
12	35 0	30 2	27 0	*	19 0	12 0
13	2 6	6 8	2 0	*	24 0	*
Totals.	96 6	—	89 6	—	89 6	60 8

Seams under 2 feet 6 inches are not considered in totals, seams under 2 feet are not given in table. Stars indicate no bores.

Character of the Coal.—The coal is bituminous. It varies greatly in analysis with different seams and localities. It burns with a long flame, is easily melted, produces a strong, massive, yet porous coke. The best quality seams compare favorably with average English and American bituminous coal, and are superior to any bituminous coals known in the East. All of the coal possesses the disadvantage of softness, and the second and third qualities contain a generally high percentage of ash. However, softness is not a great disadvantage, for the Chinese generally demand slack coal. By washing, the percentage of ash can be so reduced as to yield an excellent metallurgical coke. It is used for gas manufacture in the treaty ports, and is also used for domestic purposes; but like all fatty coals it possesses the disadvantage of an excess of soot.

For commercial purposes the coal is divided into three classes, "Navy," "Locomotive" and "Household." It may be said here that sufficient reliable data was not preserved of the borings to discuss the quality of the coal except where mined, but from all indications it is the same.

Navy coal would embrace the No. 5 seam (5 to 6 feet wide), and parts of Nos. 9 (15 to 20 feet wide) and 10 (10 to 20 feet wide) at Tongshan and Hse Shan. By careful cleaning not only could this class be improved, but probably a large amount of other seams could be improved to this average. The following are analyses of several samples of this coal uncleaned: Coke, 71.06; volatile, 21.78; moisture, 0.64; sulphur, 0.98; ash, 5.54. The specific gravity is 1.285. The seams of this coal yield from 40 to 60 per cent lump coal.

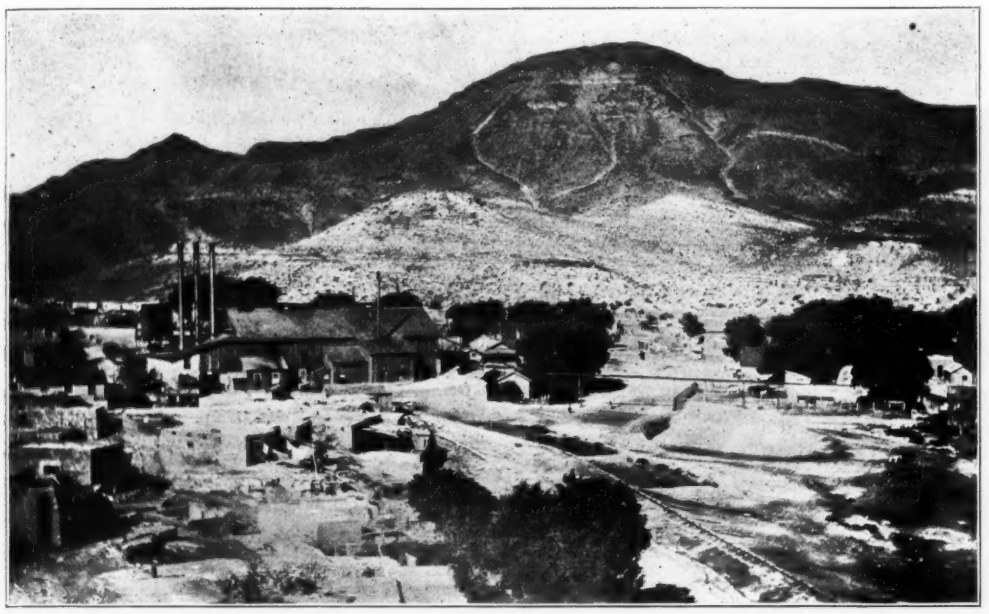
Locomotive coal would comprise remaining portion of Nos. 9, 10 and 12 seams at Tong Shan, and No. 11 seam at Linse. A large portion of the whole field, with regard to bulk, will probably fall under this class; and the quality indicated by the following analyses is, as said before, subject to considerable improvement by cleaning. The following are average analyses: Coke, 67.20; volatile, 20.45; moisture, 0.68; sulphur, 1.16; ash, 10.52. The specific gravity is 1.32.

Household coal would comprise Nos. 3, 7, 8, 11, 13, and 14 seams at Tong Shan; Nos. 9 and 8 seams Linse; and, as others, is subject to improvement by cleaning. The following are average analyses: Coke, 64.15; volatile, 19.35; moisture, 0.61; sulphur, 0.95; ash, 15.23. The specific gravity is 1.32. The yield is from 35 to 40 per cent lump coal.

At present considerable coke is made from uncleaned dust and in primitive native ovens. The best quality of this coke, the percentage of phosphorus and sulphur, is well within admissible limits, but the percentage of ash is high.

*Abstract of paper read before the Institution of Mining and Metallurgy, London, June 19, 1902.

sidio Mining Company. Spencer brought the property to the attention of the United States army officers stationed at Fort Davis, 75 miles north of the present town of Shafter. The commandant of the fort was Colonel (now General) William R. Shafter, and other officers interested were Major Bullis and Lieutenant Wilhelmji. Through their activity a company, composed largely of San Francisco parties, was organized, and the development of the property begun. Soon after work started a disagreement arose between Major Bullis and the other members of the company which resulted in the mine being closed down for four years under an injunction. During this period the Presidio Company leased and worked an adjoining section of land. After the injunction was dissolved the company began work on its own property and has worked it continuously ever since. The present officers of the company are John M. Boyd, president; William S. Noyes, superintendent, and Harry S. Gleim, resident manager.



VIEW OF SHAFTER, TEX., CIBOLO MILL IN FOREGROUND.

The region around Shafter is composed of a dolomitic limestone, which has been tilted from its original horizontal position by the intrusion of the igneous mass forming the Chinatti Mountains. These mountains in the vicinity of Shafter have a general east-west course, and the mining in the district is done on the south side of the range. The limestone strata in the locality of the mines varies in dip from 20° to 45° South. On the Presidio Company's section the angle is 22° South. Accompanying the Chinatti uplift, dikes of a porphyritic-feldspar character were intruded into the limestone, but did not penetrate through to the surface. The dikes are only apparent now on the surface where subsequent erosion of the limestone has exposed them. Two dikes cross the property of the Presidio Company, intersecting nearly at right angles, and extending from northeast to southwest and from northwest to southeast. The dikes seem to influence the location of the ore bodies in that the greater portion of the ore has been found in their vicinity, though not always in contact. The Presidio Company has obtained its best results by prospecting in the dike districts.

In general the ore of the Shafter District is an argentiferous galena, with some surface indications of copper, although none of the latter is mined. In the Presidio Mine, however, the ore is a free milling silver chloride carrying traces of gold, with only occasional and isolated pockets of lead ore. Such lead ore, which is very high grade, is shipped to the El Paso smelter, but these shipments do not average more than four car-loads per year. The line of demarkation between the silver chloride and the argentiferous galena ores seem to lie about one-half mile west of the Presidio Mine.

The ore in the Presidio Mine occurs in pockets and also as impregnations of certain limestone strata. Some of the pockets stoped out are 50 to 60 feet high and hundreds of feet square. The impregnated strata are the ore-bodies which are being extensively worked at present, and these follow the dip of the country.

The mine is opened up by two double-compartment shafts, 6 by 11 feet. The old shaft, sunk when the development work was begun, is 400 feet deep, and has four levels at intervals of 100 feet. The drifts and cross-cuts from this shaft amount to more than 20 miles, and the amount of ore taken out would closely approximate 300,000 tons. The new shaft, which has been sunk within the last two years, is now at a depth of 700 feet, with levels at the depths of 500, 600 and 700 feet. Ore has been mined on the fifth level, but has just been cut on the sixth. The ore is following the dip of the limestone, 22° south, and the drifts on the sixth and seventh levels are being driven south to cut the ore-body. The new shaft opens up about 2 miles of drifts.

OLD SHAFT, PRESIDIO MINE, TEXAS.

From the mines the ore is hauled in wagons to the mill located on Cibolo Creek, about 1 mile distant. This mill is the property of the Cibolo Creek Mining and Milling Company, which, although incorporated separately, is directed by the same management which has charge of the Presidio Mine. Considerable stock in both companies is owned by the same individuals, and they are essentially the same corporation. At the mill the treatment of the ore is by the Washoe process, modified by the Boss system of amalgamating pans. The ore is first passed through rock-breakers and then into a 15-stamp battery where stamps weighing 900 pounds fall 8 inches at the rate of 103 drops per minute. There is no battery amalgamation. The pulp passing through a 24-mesh screen, is collected in 12 settling tanks which extend along the mill at the side of the battery. After settling the ore is shoveled into 12 amalgamating pans which are on a lower level. In these pans the salt, quicksilver and copper sulphate are added, and the stirring continued till the metal is amalgamated. The time required in this operation is about 3 hours. The chemical reaction is the usual one of this process. The salt and bluestone react to form copper chloride and sodium sulphate.

$$CuSO_4+2NaCl=CuCl_2+Na_2SO_4.$$

The copper chloride acts on any silver compounds present to convert them into silver chloride, which dissolves in the excess of sodium chloride. The quicksilver added to the chloride of silver reduces it to the metallic state, when it forms an amalgam.

$$2AgCl+2Hg=HgCl_2+Ag_2Hg.$$

From the amalgamating pans the pulp is run into six settlers, on a still lower level, and the amalgam is collected and retorted. The bullion is shipped to San Francisco for refining. The tailings are again run through the mill. The mill treats about 62 tons of ore daily, and it requires 6 hours for the completion of the milling process. The average of savings has never fallen below 85 per cent.

The present low price of silver necessitates some changes in the management of the property. The surrounding country has been denuded of trees for use as fuel, and wood is now hauled to the mine from a distance of 40 miles. The plan of substituting oil in place of wood is being contemplated. By adopting this method a saving of at least one-third in the mere cost of the fuel will be effected, not taking into consideration the dispensing with the services of firemen and watchmen. It is further decided to substitute a tramway for the present system of hauling ore in wagons. Whether this tramway will be a narrow gauge railroad or an aerial rope line is not yet determined.

From its unique position as the only silver mine in Texas, and from the fact that it has maintained a constant and profitable production, even in the face of a constantly falling market, the Presidio Mine is deserving of attention as an indication of the possibilities of an entirely undeveloped field.

The coke furnished the Han Yang Iron Works is stated by their engineers to be superior to all Asiatic cokes furnished, and gave an average of ash 12 per cent, sulphur 0.82, phosphorus 0.05. This coke was made, as said, in very primitive ovens and without cleaning.

The average of estimates by various engineers called in at the time of the recent transfer of the company gives above a distance of 2,000 feet vertically, a recoverable amount of coal of about 400,000,000 tons, or a supply not likely to be in demand over the Asiatic coast or on the Pacific for some years to come.

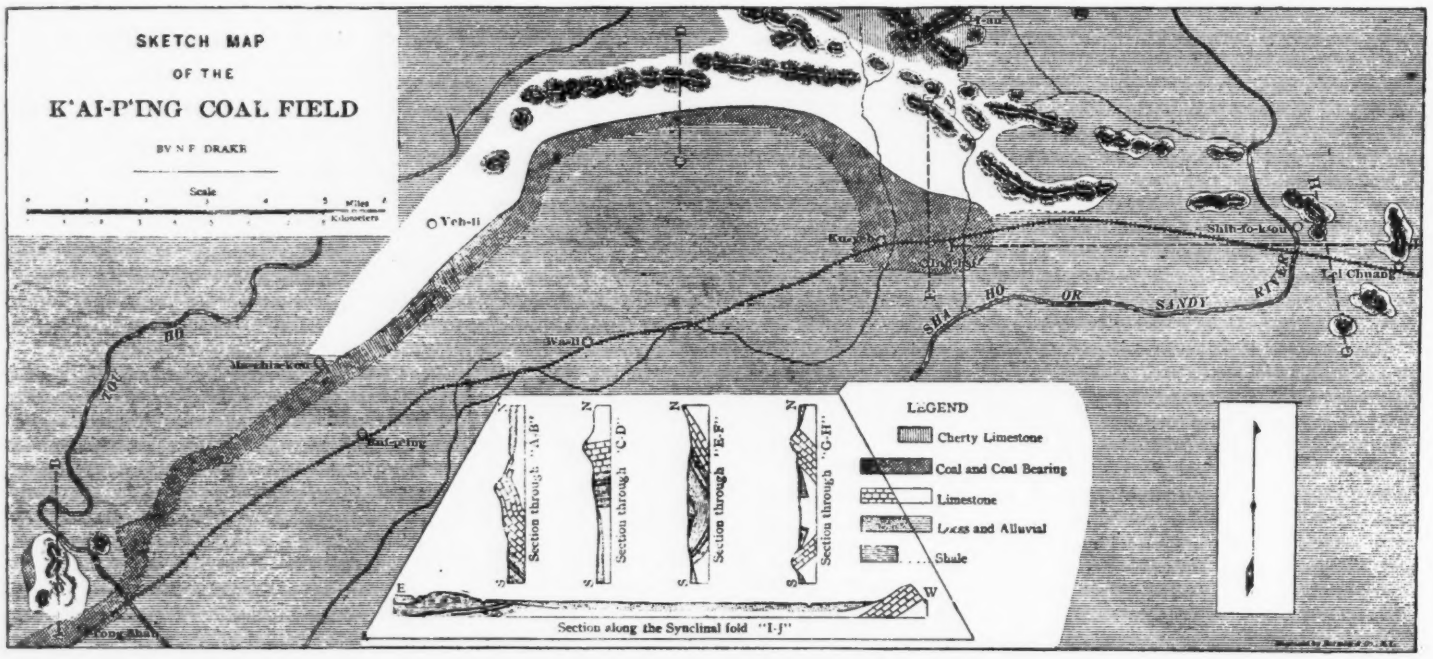
The peculiar conditions of labor coupled with the steepness of the seams have given cause for the development by the engineers in charge of a peculiar system of coal mining. Briefly, it is a modification of metal mine methods of overhead stoping, the entire ground excavated being filled with rock lowered from the surface.

Cost of Mining.—The old company's accounts are kept in Chinese, and are neither available nor designed to elucidate costs. Nor would the costs shown be of any interest further than an exhibition of the maximum amount possible to attain. Workmen's wages are very low—coolies 10 to 15 cents per day, native miners 12 to 20 cents, skilled mechanics 24 to 36 cents. Double-tracked roadways cost, including bricks, masonry, etc., about 75 cents to $1.25 per foot. Much has been written of the cheap labor of China, but those who have experienced its disadvantages have written but little. The simply appalling and universal dishonesty of the working classes, the racial slowness, and much lower average of intelligence, gives them an efficiency far below the workmen of England and America. Neither is the Chinese working man in China to be judged by his countrymen in America, who, coming by natural selection from the best working class, are freed from a maze of custom and superstition, and imbued by the spirit of another country, which makes him unrecognizable in China. For crude labor, such as surface excavation, he has no equal, but as we proceed up the scale of skill he falls further behind, until when we arrive at the skilled mechanic and factory operative the productive costs with Chinese labor are as great per unit of production as in England and America.

Market.—A matter of no little interest of coal miners in China is the peculiar character of the market. I presume that growing out of the fact that the coal production of China hitherto has been coal procurable above water level and therefore somewhat decomposed, the Chinese have grown to the use of slack coal. Their stoves and kilns are constructed therefor, and where lumps are demanded briquettes are made with clay-binding and preferred to lump, so that the native market is for slack coal and that regardless of percentage of ash. Though the Kaiping mines have produced since the beginning over 3,000,000 tons of slack, there is no culm pile—all has been sold to the native market. The price at present for slack is $2 per ton at pit's mouth and lump $4.

This company is preparing for an output of 2,000,000 tons per annum, a portion of which will be exported to western America.

Matters of collateral interest to those engaged in the enterprise are on a scale much above prosaic occidental coal mining. The superstition of the miners finds many vents, and every accident is begot by some special devil and usually exorcised by fire-crackers. The lack of gas frequently re-occurs as a special blessing. The mulishness of the native miner in his refusal to accept instruction—to undercut the coal is a thing he has ever refused to embrace, preferring to cut straight from the face; his capacity for thieving permits the abstraction of nails, screws, nuts, and even coal; his phenomenal capacity at bribery and squeeze require constant vigilance. The disregard for human life permits cheap mining by economy in timber, and the aggrieved relatives are amply compensated by the regular payment of $30 per man lost. Cases have been proved of suicide for the amount, and other cases where six grief-stricken fathers claimed the reward for the same man.



PHOSPHATES IN PORTO RICO.—The Porto Rico *Trade and Agricultural Journal* says that deposits of calcareous phosphate are to be found at San Germán, Cabo Rojo, Lajas, Isabela, Manati, Ponce and Pueblo Viejo, and many concessions have been given by the government and private owners for their exploitations. However, the largest deposits are on the islands of Caja de Muertos and Mona.

The island of Caja de Muertos is situated south of Porto Rico, about 8 miles from Ponce harbor, and contains an immense amount of phosphate and guano, analyses of which, made at London, Paris and Hamburg, have shown highly satisfactory results. The right of exploitation of this island was awarded to Mr. Miguel de Porrata Doria by the military government of Porto Rico in 1899, by Department Commander General Guy V. Henry.

The island of Mona is situated west of Porto Rico, about 34 miles from the city of Mayaguez, and is worthy of especial and separate mention on account of the richness of its deposits. The right of exploitation of the deposits at Mona was granted by the Spanish Government, in March, 1877, to Porrata Doria and Contreras & Co., and said concession will hold good until 1907.

THE SILVER MINE OF TEXAS.

By HENRY M. ADKINSON, Denver, Colo.

Texas is not usually looked upon as a State which offers any field for mining operations, because what mining is done there in confined to an extremely limited area. It is a fact of more than passing interest, and suggestive of important possibilities, that the silver production of Texas, which State in 1900 ranked eighth among the silver producers of the United States, is entirely the output of a single mine.

This is the Presidio Mine, located at Shafter in Presidio County. The nearest railroad station is Marfa, lying 50 miles to the northeast, on the Southern Pacific Railroad. Several years ago the Hazel Mine in El Paso County was a silver producer, and it is thought that up to 1891 about $60,000 worth of ore had been shipped. That mine has not been worked for several years and the present State Geological Survey has no record of its output. These circumstances seem a sufficient reason for a brief history and description of the Presidio Mine.

The Presidio Mine was opened up 18 years ago, and has been a constant and notable producer ever since. The amount of its output is, of course, not public information, and the only estimates possible are to be obtained from the State publications and by compilation from mint reports. A bulletin[1] issued by the Texas Geological Survey in January, 1902, says of the Presidio Mine: "In this region there is now one of the most successful silver mines in the country, that at Shafter, Presidio County. This mine produced more than $6,000,000 worth of silver during the last fourteen years." The table of the silver production of Texas, compiled from *The Mineral Industry,* from 1893 to 1900 inclusive, gives the following figures, which may be regarded as essentially the output of the Presidio Mine:

Year.	Troy ounces of Silver.	Commercial Value.	Price per oz.
1893	349,400	$282,132	78.2c.
1894	429,314	270,468	63.0c.
1895	529,974	346,073	65.3c.
1896	525,400	352,543	67.1c.
1897	600,000	358,740	58.79c.
1898	500,000	291,300	58.26c.
1899	450,000	268,110	59.58c.
1900	525,000	322,403	61.41c.
Total, 8 yrs.	3,909,088	$2,491,769	.....

These figures show a yearly average of more than $300,000.

Among the early prospectors in the Shafter District was one John W. Spencer, who came into this region as a guide during the Mexican War. In the course of his explorations he found mineral indications on the section now owned by the Pre-

[1]University of Texas Mineral Survey, *Bulletin* No. 2, 1902, page 5.

The mill product was 20,435 ounces gold and 26,369 ounces silver; the product from tailings was 3,411 ounces gold and 13,498 ounces silver; a total of 23,846 ounces gold and 39,867 ounces silver. The average recovery in the mill was 84.2 per cent of the assay; in the tailings plant, 69.7 per cent.

With regard to purchase of new properties, Manager E. V. Orford's report says: "During the year a number of properties have been brought to our notice, and some of the more promising of these have been investigated at an expense of $650. A working bond and option to purchase were acquired on the Idahoan Mine at Hailey, Idaho; but, as the property failed to come up to the representations made regarding it, after the expenditure of $4,635, work was discontinued and the option relinquished.

"A one-fourth share in the Afterthought Group, on War Eagle Mountain, in this neighborhood, covering the extension of the main vein of that mountain, formerly a noted producer from every claim developed on it, was also acquired, together with an option to purchase the remainder for $50,000. A shaft had been sunk by the owners 83 feet through drift to the solid granite formation, and a cross-cut of 45 feet run to the vein, exposing a well-defined fissure between 2 and 3 feet wide, carrying values from $15 to $53 per ton, the larger portion being gold. This shaft was continued 4 by 6 feet to a depth of 290 feet. At 280 feet a second cross-cut of 20 feet cut the vein, which at this point was 4½ feet wide. On this level no general average sampling of the vein was made; but samples taken at random assayed from a few dollars to $50 per ton, silver predominating. On cutting the vein a flow of water of about 20 gallons per minute was encountered, which was handled with a bucket. Drifts—extended a total length of 74 feet south and 55 feet north on the vein—found good values, but failed to enter an ore-shoot. As storms were threatening, and work could not be prosecuted during the winter without considerable further outlay, it was decided to cease operations, and await developments in adjoining properties. On the surface the main improvements consist of a shaft-house, 16 by 28 feet; engine room, 17 by 17 feet, with a hoist removed from De Lamar; boiler room, 16 by 30 feet, with a boiler removed from De Lamar, set on granite foundation; one-story boarding house, 18 by 50 feet; the total outlay on development and other improvements being $8,538.

"In connection with the above, it is of interest to note developments on this vein in an adjacent property. At a point 6,100 feet from its mouth, the Sinker Creek Tunnel, operated by the War Eagle Mining Company, has recently cut this vein at a depth of 2,000 feet below the collar of the Golden Chariot shaft; and at its intersection, by a cross-course, the vein has made a deposit of typical old-time War Eagle ore, copper-stained and rich in free gold. Drifting on the vein is being vigorously prosecuted with machine drills by the War Eagle Mining Company. It is also worthy of note that at this considerable depth the ore is oxidized."

The directors' report says: "The old De Lamar Mining Company, Limited, was finally dissolved by resolution on July 16 last, and the present company was registered on July 23. In the accounts now presented, covering a period of 12 months, the operations for the first 3 months and 23 days were under the old company and for the remainder of the time under the new company. The mine manager's report of mining and milling operations covers the whole period of 12 months. Thus explained, the revenue for the period under review amounted to £39,451 (net of income tax). From this have been paid dividends of 2 shillings per share or 10 per cent, and since the closing of the accounts a further 3 shillings per share or 15 per cent, of which £11,551 represented the profits of the old company. At the annual meeting it will be proposed that a final dividend of 2 shillings or 10 per cent be paid, making a total distribution of £28,000 or 35 per cent for the year. Of the capital of £80,000, property at De Lamar is represented by £17,983, Afterthought Claim expenditure by £1,742, leaving a balance of £60,275 capital unexpended. The total available resources of the company, apart from property and plant, and after payment of the above mentioned three dividends, are therefore £71,149 represented entirely by cash and liquid assets. Applications for shares in the new company had been received to the date of closing of the accounts in respect of 338,420 old shares, and the equivalent 67,684 shares in the new company have been allotted in exchange. Applications had not been received in respect of 61,580 old shares, equivalent to 12,316 new shares, but a large number of these outstanding claims have since been received.

"The total mine revenue, including surplus on 1901 bullion and miscellaneous receipts, was £105,975, obtained at a cost of £63,046. The cost was $6.87 per dry ton, as compared with $6.65 in the preceding year. The cost per ton of treating the tailings was $1.84, as compared with $1.58 in the preceding year. The treatment of the accumulated stock of tailings having been completed, the Board took the opportunity of a favorable offer being made for the tailings plant, site, etc., to sell the whole for a sum of $10,000 in cash, which amount will appear in the accounts for the next financial period.

"At the time of the last meeting of the old company, a year ago, the reserves of ore in the mine had fallen to a very low point, and the prospecting in depth had failed to disclose any new payable orebodies. But in August Mr. Huntley was able to report important discoveries to the west of the old upper workings, and since that time the mill has run chiefly on ores from that region. From the lowest levels in the eastern part of the property considerable exploration was carried out by diamond drill but without result, and operations in that direction may now be considered closed. With regard to the acquisition of another property, nothing final has been accomplished, although inquiries and examinations have been made in more than one direction. Mr. Orford, in his report above, describes the position of the matter, but no decision as to further operation has yet been arrived at.

"The decision in regard to the De Lamar patent suit was given in the United States District Court at Boise, Idaho, in favor of the company. An appeal by the plaintiff has since been heard in the United States Circuit Court at San Francisco and the decision in favor of the company was confirmed on June 6 last."

BOOKS RECEIVED.

In sending books for notices, will publishers, for their own sake and for that of book buyers, give the retail prices. These notices do not supersede review in a subsequent issue of the ENGINEERING AND MINING JOURNAL.

Twentieth Annual Coal Report of the Illinois Bureau of Labor Statistics, 1901. David Ross, Secretary of Bureau. Springfield, Ill.; State Printers. Pages, 322.

Eighth Annual Abstract of Labor Statistics of the United Kingdom. 1900-1901. Prepared by the Labor Department, Board of Trade. London; H. M. Stationery Office. Pages, 220.

The Timber Resources of Nebraska. Reprinted from *Yearbook* of the Department of Agriculture. By William L. Hall. Washington; Government Printing Office. Pages, 20; illustrated.

British Columbia. Annual Report of the Minister of Mines, 1901, William Fleet Robertson, Provincial Mineralogist. Victoria, B. C.; Public Printer. Pages, 348; with maps and illustrations.

Massachusetts. Statistics of Manufacturers, 1900-1901. By Horace G. Wadlin, Chief of the Bureau of Statistics of Labor. Boston; State Printers. Pages, 124.

Twelfth Census of the United States. Bulletin No. 210. Manufactures, Chemicals and Allied Products. By Charles E. Munroe and Thomas M. Chatard. Washington; United States Census Office. Pages, 308.

Geological Survey of New Jersey. Annual Report for 1901. Henry B. Kümmel, State Geologist. Trenton, N. J.; State Printers. Pages, 180; with maps and illustrations.

Thirty-second Annual Report of the Deputy Master and Comptroller of the Mint of the United Kingdom, 1901. Horace Seymour, Deputy Master, London; H. M. Stationery Office. Pages, 180; illustrated.

Die-Wohlfahrts-Einrichtungen der Arbeitgerber zu Gunsten ihrer Angestellen und Arberter in Oesterreich Erster Theil; Erster Heft. Privat-Eisenbahnen. Prepared in the Imperial Statistical Bureau. Vienna, Austria; printed for the Bureau. Pages, 240.

Twelfth Census of the United States. Volume III, Vital Statistics. Part I. Prepared under supervision of William A. King, Chief Statistician for Vital Statistics. Washington; United States Census Office. Pages, 1,012.

Statistical Notes on Lead, Copper, Zinc, Tin, Silver, Nickel, Aluminum and Quicksilver. 1901. Compiled by the Metallgesellschaft and the Metallurgische Gesellschaft, A.-G. Frankfurt-aur-Main, Germany. Pages, 64.

Investment and Speculation in British Railways. By William J. Stevens. London, England; Effingham Wilson. Pages, 262; with 13 tables. Price (in New York), $1.40.

BOOKS REVIEWED.

Gradation for Mine Management. By Myles Brown. Wigan, England; Thomas Wall & Sons. Pages, 112; with tables and diagrams. Price (in New York), 75 cents.

The little volume contains a number of lessons in arithmetic, mechanics, mine operation and the preparation of coal for market. It is elementary in its instruction, and is intended chiefly for the working coal miner who wishes to pass the examinations required in Great Britain for promotion to a better position. It is, of course, written chiefly for the British miner, but contains a good deal of information which may be useful to coal miners everywhere. Examples are drawn entirely from British practice.

Jahrbuch für das Eisenhüttenwesen. First Year. 1900. Prepared for the Verein Deutscher Eisenhüttenleute by Otto Vogel. Düsseldorf, Germany; A. Bagel. Pages, 460; illustrated.

This is the initial volume of a new metallurgical year-book, which is brought out under the auspices of the Verein Deutscher Eisenhüttenleute as a supplement to *Stahl und Eisen,* and will deal especially, as its title indicates, with progress in the arts of iron and steel-making. The editor is evidently very ambitious and the present volume is very comprehensive in its scope. The principal subdivisions comprise (a) general part, (b) fuels, (c) firing, (d) refractory material, (e) slags, (f) ores, (g) installations of works, (h) pig iron production, (i) foundry work, (k) wrought iron and steel production, (l and m) the working up of wrought iron and steel, (n) properties of iron and steel, (o) alloys and combinations, (p) testing of material. Each one of these chapters includes numerous sections, which are in many cases further subdivided, the arrangement of the work being analytical throughout. A list of the periodicals of which the contents have been noted extends over seven pages and includes all the principal technical journals of the chief countries of the world.

Criticism of such a book is generally confined to the method of its preparation, not to its contents, and there is ample opportunity for difference of opinion as to this. With the rapid extension of knowledge and the multiplicity of periodicals for its dissemination it is constantly becoming more and more of a problem as to how it is to be put in a permanent and easily accessible form. It is for this purpose that the year-book has been found to be useful. It collects the information from scores of periodicals, of which only a small percentage will

RECENT DECISIONS AFFECTING THE MINING INDUSTRY.

SPECIALLY REPORTED.

DUTY ON BOILER-PLATE SHEARINGS—SCRAP STEEL.—Boiler plate shearings are not dutiable as steel billets under paragraph 135, act of July 24, 1897, but are dutiable as scrap steel at the rate of $4 per ton under paragraph 122 of said act.—Appeal of Milne & Co., from Collector of Customs at New York; Board of General Appraisers.

DUTY ON FIRE-BRICK.—Fire-brick weighing more than 10 pounds each are not dutiable under paragraph 87 by similitude to fire brick weighing less than 10 pounds each, but are dutiable at 35 per cent ad valorem under the provision in paragraph 97 for articles composed of minerals or mineral substances.—Appeal of Wing & Evans from Collector of Customs at New York; Board of General Appraisers.

DUTY ON NAIL-RODS—CHARCOAL IRON.—Nail-rods are specifically provided for in paragraph 136, act of July 24, 1897, and the fact that such articles are made by the charcoal process will not take them out of the operation of that paragraph. Only such articles as are enumerated and provided for in paragraph 124 are covered by the proviso to that paragraph. The operation of a proviso is limited to the paragraph of which it forms a part unless otherwise expressly provided for.—Appeal of Milne & Co., from Collector of Customs at Philadelphia; Board of General Appraisers.

DUTY ON TIN DROSS OR GRAIN TIN.—The terms "tin dross," "tin ash," "black grain tin," "black oxide of tin," "scruff," as used in trade and commerce, designate and include only one class of merchandise. Such terms are used in commerce and trade interchangeable, and comprise the article described in paragraph 683, act of July 24, 1897, as "black oxide of tin" and "grain" tin. Tin dross is entitled to free entry under said paragraph as black oxide of tin or grain tin.—Appeal of Marks, Lissberger & Son from Collector of Customs at New York; Board of General Appraisers.

WHEN LAND OFFICE CANNOT ISSUE RECEIVER'S RECEIPT.—Under the laws of the United States (Section 2326) providing that on filing an adverse claim all proceedings except the publication of the notice and filing of the affidavit regarding same shall be stayed, the Land Office has no jurisdiction to issue a receiver's receipt for mining applicant during the pendency of the action brought in support of an adverse claim.—Deeney v. Mineral Creek Mining Company (67 *Pacific Reporter*, 724); Supreme Court of New Mexico.

LIABILITY OF TRANSFEREE OF PARTLY PAID STOCK.—A transferee of partly paid stock impliedly promises to pay future calls on the same where a certificate of stock issued to him, and he receipts for it, and accepts it, and it expressly appears from the certificate that the stock is subject to future calls to the amount unpaid thereon, and after becoming such stockholder, several calls are made on him, for which he sends checks to pay, expressly stating that the money was for that purpose.—Sigua Iron Company v. Brown (64 *Northeastern Reporter*, 194); Court of Appeals of New York.

TITLE TO ORE TAKEN FROM STREETS OF A CITY.—Where there has been such a dedication of land by plot that the city should be bound in an action for damages arising out of such streets and their use by the city, the city will be entitled to the ore taken thereunder, although the dedication may have been irregular and its acceptance not strictly in accordance with the law regarding same; and the dedicator by plat and his assignors will thereby be prevented from denying the dedication entitling the city to the ore lying under the portions shown to be streets by the plat.—City of Leadville v. Coronado Mining Company (67 *Pacific Reports*, 289); Supreme Court of Colorado.

ABSTRACTS OF OFFICIAL REPORTS.

Michigan Copper Mining Company.

This company is engaged in developing a copper mine in the Lake Superior region. Its report covers the year ending December 31, 1901. The financial statement shows balance from previous year, $29,148; assessment No. 1, $97,777; interest, $272; total, $127,197. The expenditures at mine were $107,137; Boston office, $6,088; total, $113,225, leaving a balance of $13,972 at the close of the year.

President John Stanton's report says: "The plans for the development of the property, which were outlined in our last report, have been steadily pursued during the year. The drainage of the old Minnesota Mine has been accomplished by tapping the water through diamond drill holes bored at intervals from B shaft on the Calico lode into the old workings of the Minnesota Mine, while both of the shafts on the Calico lode have been carried down to a depth of 1,367 and 1,234 feet respectively.

"Crosscuts from the eighth, ninth and tenth levels at B shaft were driven to the Minnesota lode (about 160 feet distant), all of them coming into the old workings; that from the tenth level coming very close to the deepest point worked in the old mine. We have not yet been able to see much of the standing part of the lode, and must wait for similar crosscuts from A shaft, as well as further drifting and sinking on the lode before anything positive can be known of its character.

"In driving the crosscuts from B shaft, a vein was intersected that, so far as explored, is rich in mass and barrel copper, with some high-grade stamp rock. It lies between the Calico and the Minnesota or Conglomerate lodes, apparently converging both in strike and dip towards the latter, and it is probably one of the system of veins connected with the Minnesota deposit, which proved so productive in the early days of mining in that region.

"The report of our superintendent gives in detail the extent of development work, and the indications at the various points opened, and there seems to be good reason for proceeding without delay to complete the equipment of the mine, and make preparations for a large and regular output by the time that a modern stamp mill can be erected, and made ready for operation."

Calumet and Hecla Mining Company, Michigan.

The report of this company for the year ending April 30, 1902, contains, as usual, only general statements, with very few particulars as to the operations of the mine or costs of production. The balance sheet at the close of the year, compared with that for the preceding year, is as follows:

	1901.	1902.		Changes.
Cash and copper on hand.	$3,487,856	$3,950,576	I.	$462,720
Notes, bills receivable, etc.	382,012	366,658	D.	15,354
Insurance fund	....	149,937	I.	149,937
Total assets	$3,869,868	$4,467,171	I.	$597,303
Drafts and bills payable	$760,899	$502,816	D.	$258,083
Machinery contracts	640,839	371,576	D.	269,263
Balance set aside	300,000	....	D.	300,000
Total liabilities	$1,701,738	$874,392	D.	$827,346
Balance of assets	$2,168,130	$3,592,779	I.	$1,424,649

President Agassiz says in his report: "During the past year we produced mineral equal to 42,462 tons of refined copper as against 37,932 tons in the previous year (this small production was due to the fire at the mine of that year). Our product in refined copper was 39,982 tons. For the previous year our product in refined copper was 36,326 tons. The price of copper has varied from 16 5-8 to 11 cents per pound and is now about 12½ cents.

"There have been paid during the past fiscal year one dividend of $15 and two of $10 each.

"We have continued to push the openings on the conglomerate belt in the vicinity of the Red Jacket shaft. I regret to state, as noted in previous reports, that the character of the lode has not improved in depth.

"The machinery destined to operate the Osceola amygdaloid lode is slowly being delivered. Meanwhile it has been deemed best to discontinue underground work upon this lode.

"During no year, perhaps, in the history of the mine has so large an equipment been added by the company as during the past year. The Superior compressors have been remodelled. Electric pumps have been placed in No. 7 Hecla shaft. Additions to the drill shops have been built; also, a new change house for Nos. 7 and 8 Hecla shafts, and a new manhoist and its building for the same shafts. The changes in the principal Hecla hoisting engine house have been completed. We have extended our railroad track on the back of the lode, and have purchased two new locomotives. The railroad track at the mills has been put in excellent order. We have built 24 houses for the men and two for the officers. The houses of the company have been kept in good repair. At the Torch Lake canal a dredge has been at work during part of the summer improving the channel. The canal is now well lighted according to suggestions from the resident officer of the United States Engineer corps.

"The addition to the Hecla mill is now finished. It is a well designed and well lighted structure planned and erected by the American Bridge Company. The equipment of the addition to the mill is progressing favorably. One head is ready to go into commission—the others will follow in rapid succession. The house for the new 60-foot sand-wheel has also been erected by the American Bridge Company, the foundations for the wheel are in place and the greater part of the wheel has been delivered at Torch Lake. The new steel electric power house to drive the mill and sand-wheel has been erected, and the foundations are ready for the main driving engine which has been moved to the lake from the Hecla hoisting engine house. The spare engine, as well as the generators and motors for the sand-wheel and mill additions, are at Torch Lake. A tunnel for the electric cables connects the power house with the mill. An additional pump has been placed in the mill pump house and is ready to go into commission. The equipment of the new timber mill at the head of Torch Lake is in place and the mill will be shortly at work.

"At the Lake Linden Smelting Works five large size furnaces have been rebuilt. This change will result in considerable economy in smelting. At the Buffalo Smelting Works the new electrolytic plant has been completed and a new wharf has been built.

"The expenditures for the Aid Fund during the fiscal year amounted to $66,489. The value of the Aid Fund at cost is $136,234.

"We have made some successful experiments with a full-sized model of a Kimberly hoist. It is proposed to install such a hoist at the Red Jacket shaft during the coming year. Interesting experiments are making with our waste sands by Messrs. Taylor and Woodworth which it is hoped may lead to a marked saving of the wastes of our mills."

De Lamar Company, Limited, Idaho.

The report of this English company, operating the De Lamar Mine in Idaho, covers the year ending March 31, 1902. The mine report shows the following gross product for the year, the total output having been 23 tons high grade ore shipped and 35,469 dry tons of ore milled; in addition there were 937 tons coarse tailings and 22,985 tons old tailings cyanided:

	Total.	Per ton.
Ore shipped	$1,638	$70.88
Ore milled	434,226	12.24
Coarse tailings	1,779	1.90
Tailings worked	78,332	3.97
Miscellaneous	3,904	...
Total	$519,879	...
Expenses	397,793	...
Profit	$212,086	...

The cost of the shipping ore was $877, leaving a profit of $761. The cost of the ore milled per ton was: Mining, $3.7739; shipping ore $0.0247; milling, $2.7046; taxes, bullion charges, renewal of machinery, etc., $0.3675; total, $6.8707 per ton. The cost of operating the tailings plant per ton was: Labor, $0.6242; chemicals, $0.8853; fuel, $0.1546; other supplies, $0.1270; assaying and express charges, $0.0510; total, $1.8421.

in any probability come to the notice of any individual, weeds out the ephemeral and inconsequential and condenses the valuable, so that the investigator has a permanent record of the progress in the art. But with the increase in knowledge and the publication of it, the question comes more and more to the fore as to how this is to be done. It is no longer possible to epitomize everything in one annual volume, or even in one for each branch of science and technology. Shall it then be left to the editor to select and abstract only that which he deems important? Or shall he do that and in addition recite the references to the rest? Or shall he recite titles alone?

None of these methods is satisfactory to us. If the editor exercises his discrimination as to the important and the non-important, he is naturally biased by the scope of his own interests and is therefore likely to overlook or omit the matters of interest to workers in another field; moreover, that which appears to be of no value this year may be of great value next year, or in five years. Consequently this method of compiling a year-book is imperfect and unsatisfactory. It is improved without doubt, by citing the references to the publications which it has not appeared worth while to abstract at the time, but here arises the difficulty that not only are the original publications likely to be unobtainable a few years after their date of issue, but also only a comparatively few of them find places in our greatest libraries. We say this from practical experience in the libraries of New York and Boston, which presumably afford as good advantages as any in the United States; we are unable to speak as to the libraries of Europe.

In our opinion, the modern year-book should abstract everything, and inasmuch as it would be obviously impossible to do that in one volume, the number of volumes should be multiplied. In other words, the recording of technical and scientific knowledge should be specialized, in just the same way as practical work, and needless duplication should be avoided. The book which we have now under review deals with a very broad subject. The editor has adopted the plan of abstracting the important, or what has appeared to him at the time to be important, and has cited references to the rest. In so far as his work is concerned it appears to have been well done; our criticism is as to the method alone. In this particular case a good deal of space is devoted, among other things, to the subjects of fuel and its combusion and to refractory material. Now those subjects are of great importance to the iron and steel metallurgist, it is true, but they are also of importance to the lead, copper and zinc metallurgists and to others as well, and we think they should be treated in separate year-books, which would be available to all, and would thus leave the iron and steel, and copper-lead-zinc, etc., year-books more space in which to treat of their specialties and present abstracts of everything new. When the mass of knowledge which is developed annually outgrows that system it will be necessary to specialize more minutely. It would be highly valuable if we could have a compendium of all knowledge in one volume, or even a hundred volumes, but we may as well recognize the impossibility of that.

CORRESPONDENCE.

We invite correspondence upon matters of interest to the industries of mining and metallurgy. Communications should invariably be accompanied with the name and address of the writer. Initials only will be published when so requested.
Letters should be addressed to the Managing Editor.
We do not hold ourselves responsible for the opinions expressed by correspondents.

Dry Crushing—Krom Rolls.

Sir: The second very valuable paper on "Dry Crushing of Ores" in your issue of July 12th, contains a statement in regard to rolls, to wit: "Inasmuch as the Krom rolls, although now greatly 'improved upon by others, are nevertheless a high class machine." While mining I have become much interested in the subject of crushing ores, and believe good rolls to be the best machine for the purpose, especially when concentration or leaching are required. I would appreciate the courtesy if you would inform me what the "great improvements" are, which you say have been made "in the Krom rolls by others," and who the manufacturers are that are making rolls superior to Krom's. Others like myself who are interested in the subject of dry crushing will, I think, appreciate the information which no doubt you can give. I am aware that some manufacturers are making rolls which might be mistaken for the Krom type; that is, two separate disconnected swinging pillow blocks instead of connected as in Krom's. I understand that the makers of such rolls represent that such a construction is equal if not superior to the Krom type, and even represent them as Krom rolls. If you have in mind that such rolls are an improvement on the Krom type, I doubt if any will agree with you who are up in roll construction. It may be that the rolls in the Mount Morgan mill are not equal to the present standard Krom roll, as those rolls must have been made as long ago as 15 to 16 years, at which time Mr. Krom was struggling to convince the mining profession of the superiority of roll crushing over stamps; but now every one who understands the subject at all knows that rolls in most cases are superior.

I am not prepared to accept the data given for the performance of the ball pulverizer at the Mount Morgan Mine. I believe a properly designed and equipped roller mill will do the work cheaper and certainly give a better product. There is a disadvantage in the production of such a large amount of fine dust as the ball pulverizers must produce, crushing to pass a 20 to 35-mesh screen for the metallurgical process which follows.

I did not intend to write so much. I started simply to ask for a description of the improvements which others have made on the Krom roll.

Yours truly,
C. Amory Stevens.

New York, July 17, 1902.

[The article in question was not given as our own opinion, but as an abstract of the paper written by Mr. Argall, who is certainly familiar with all dry crushing processes, and with the different forms of rolls. Changes in crushing machinery are constantly being made, and it is impossible to enumerate here all that have been made—which may or may not be improvements. We do not think, however, that Mr. Argall intended to depreciate the Krom rolls, which have been for so long a time a standard type of this machine.—Editor E. & M. J.

QUESTIONS AND ANSWERS.

(Queries should relate to matters within our special province, such as mining, metallurgy, chemistry, geology, etc.; preference will be given to topics which seem to be of interest to others besides the inquirer. We cannot give professional advice, which should be obtained from a consulting expert, nor can we give advice about mining companies or mining stock. Brief replies to questions will be welcomed from correspondents. While names will not be published, all inquirers must send their names and addresses. Preference will, of course, always be given to questions submitted by subscribers.

Bauxite.—Who are the chief users and buyers of bauxite in this country?—E. P. A.

Answer.—The chief consumers of bauxite in this country are the Pittsburg Reduction Company, Niagara Falls, N. Y., and the Pennsylvania Salt Manufacturing Company, of Natrona, Pa. The Pittsburg Company controls several bauxite deposits in Alabama and Arkansas.

Sea-Water for Water Jackets of Furnaces.—Can you inform us if any data are available with regard to the use of sea-water for the cooling of the water jackets of a copper smelting blast furnace. Will the prolonged passage of salt water have any deleterious effect upon the jackets? Do you or any of your readers know of actual cases where sea-water is used for this purpose when sweet water is not available?—S. V.

Answer.—Sea-water has been used in several cases for cooling blast furnace water jackets. Its use is not common in this country, because few of our copper smelters are near salt water. We have no data at hand as to the effect of water on the jackets; but probably some of our readers can furnish some notes on this point.

Talc.—What are the uses of talc, and who are the chief buyers.—S. T.

Answer.—The variety known as fibrous talc is used chiefly in paper making. The International Paper Company, of New York, is the chief consumer. This company controls several mines in the northern part of New York. Common talc has a variety of uses. It is, in powdered form, employed to some extent in paper making; it is also used in preparing the wrappers or coverings for hams, etc.; in making some of the complexion powders sold by druggists; in dressing leather; in soap making, and for other minor purposes. Steatite or massive talc is used for refractory lining of stoves, for mantels, hearthstones and similar purposes, and for making laundry tubs, etc. Among the leading dealers in talc are Hammill & Gillespie, 240 Front Stret, New York; Rickard & Hewlitt, 109 John Street, New York.

Small Lead Blast Furnaces.—What is the capacity of the smallest blast furnace (consistent with good smelting) that can be used in smelting lead ores?—J. R. U.

Answer.—It is, perhaps, difficult to set an exact limit for the smallest furnaces. An expert informs us that he has used a circular water-jacket furnace 36 inches in diameter at the tuyeres and 12 feet high in smelting lead ores, and has put through 25 tons charge in 24 hours. Fifteen years ago this was a common size. The furnace named is used to-day for treating small lots of antimony skimmings. This may be taken as an example of small furnace practice.

Mica.—Can you give me any information about mica? I think I have discovered a deposit where sheets of considerable size can be mined. Where can it be disposed of and at what price do you think? Does it have to be clear or is that that is discolored of any value?—J. J. B.

Answer.—There is a demand for good mica. The chief markets for it are in New York and Philadelphia. For use in stoves—which was formerly the chief use—the largest buyers are Eugene Munsell & Co., 218 Water street, New York. The demand for electrical work now takes the greater part of the mica. All the large electrical companies are buyers. It is impossible to give any quotations, as prices are regulated entirely by the size of the sheets which can be furnished and their quality. For stove work and ornamental purposes clearness and good color are essential; for electrical work the color makes little difference; the main requirements being freedom from cracks and flaws, uniform thickness and large size.

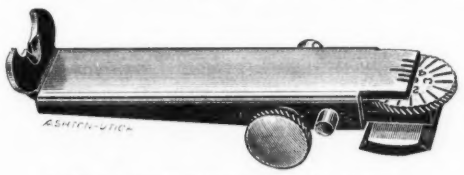
Prospecting for Gold in Guatemala.—Are there good opportunities for a gold prospector in Guatemala? Are government royalties, taxes, etc., any hindrance to profit? Is any special license required?—H. B. W.

Answer.—From all reliable accounts, while there are excellent opportunities for mining in Guatemala, it is not a good country for the average American prospector. No one should go there to prospect unless he is familiar with the Spanish language and knows something of the customs of the people. The solitary prospector is likely to have a pretty hard time in any Central American country without such an equipment. Royalties, taxes, etc., are so regulated in those countries that they may be made very oppressive unless the miner has an understanding with the local authorities. In short, Guatemala is rather a field for companies with capital than for the small miner. For the prospector there are better chances at home.

NEW MICROMETER WIND GAUGE SIGHT.

The Savage Arms Company, Utica, N. Y., has just placed upon the market a new micrometer wind gauge rifle sight.

This micrometer sight is the invention of Mr. A. W. Savage, the inventor of the Savage rifle. It is scientifically designed, being the product of much practical experience. Every part of the sight is said to be well constructed of the finest materials, strong and simple. It can be adjusted in any direction to 1-1,000 part of an inch, and is claimed to have con-

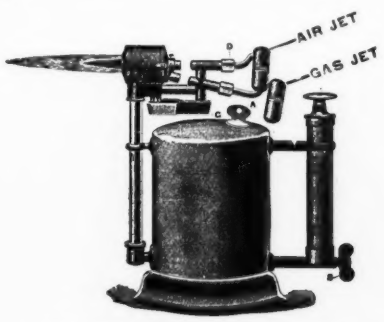


SAVAGE MICROMETER RIFLE SIGHT.

siderably more elevation than the ordinary sights in use. All adjustments are obtained by finely threaded screws, which is the only exact method for adjusting sights. It can be fitted to nearly every well-known make of rifles. The accompanying illustration shows the sight before being adjusted. It is operated as follows: To elevate or lower, press down at B, which takes off tension on elevating screw C; turn elevating screw C to any position required. For side adjustment, turn wind gauge screw D. If it is desired to set the sight permanently so that it cannot be adjusted by hand, then the extra wind gauge set screw, and extra elevating set screw should be substituted for the regular wind gauge D and elevating C screws. These two set screws are immovable by hand, and have to be adjusted by screw-driver and pin.

TURNER DOUBLE JET BURNER.

The Turner double jet gasoline blow torch, made by the Turner Brass Works, Chicago, is of the same general appearance and construction as the ordinary blow torches now on the market except the burner, in which lies the heat producing qualities and efficiency claimed for it by the manufacturers. It will be seen that the burner has two valves instead of one, as in the ordinary torches. One valve controls the air blast and the other



TURNER DOUBLE JET BURNER.

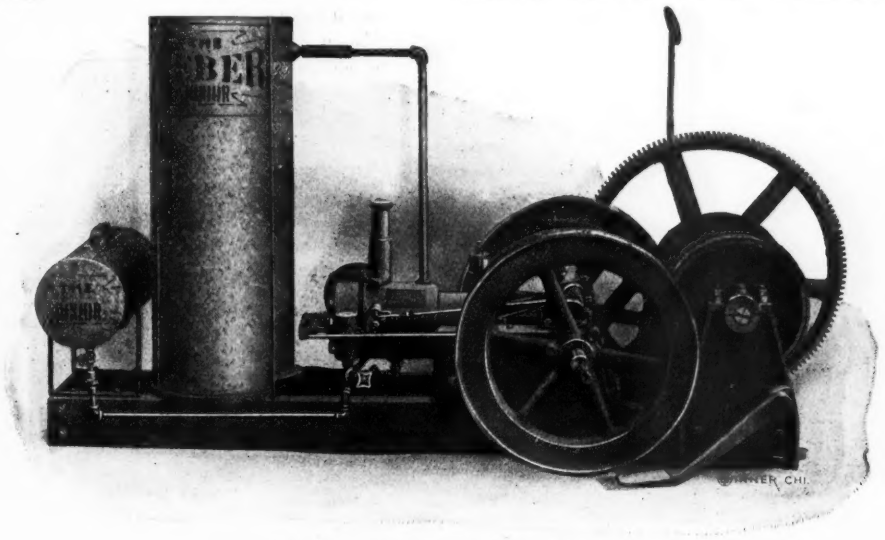
the gas. By this means the air and gas are under independent control of the operator and enter the combustion chamber in two separate jets in the proper chemical proportions, and are there united in a blue flame of an intensity sufficient to fuse nickel. The heat required to fuse nickel is very nearly 3,000°, which statement will give an idea of the heat producing power of the double jet burner and its ability to perform work.

THE ALADDIN READING LENS.

The K. & E. Aladdin reading lens manufactured by Keuffel & Eisser Co., New York, illustrated herewith is brought out for the use of engineers and surveyors who work in dark or badly lighted places, like mines, tunnels, forests, or at night (polar observations, etc.).

It combines a strong miniature electric lamp with a reflector and a reading glass, so constructed that the fine readings of verniers of surveying instruments, graduations of tapes, etc., can be conveniently and accurately taken in the dark. On removing the lens the lamp can be used as an illuminator for the cross-hairs of telescopes. Its light is free from the danger of igniting gases, which makes it particularly useful in coal mines, etc.

The K. & E. Aladdin reading lens consists of a miniature incandescent lamp mounted on a light handle, 4½ inches over all. An adjustable polished metal reflector partly surrounds the lamp and carries a detachable fine magnifying lens. On the handle is a spring switch which permits of establishing electrical contact for short periods by the pressure of a finger or for longer periods by the action of a sliding ring.



WEBER JUNIOR GASOLINE HOIST.

The lens is connected with the battery by conducting cords 4 feet long. The battery (dry) is contained in a solid sewed leather case, 7 by 3¼ by 2 inches. It consists of 4 dry cells which, for renewal, are also furnished separately in a pasteboard box, ready to slip into the leather case. The leather case is of convenient size and weight for the side pocket, or it can be carried by a shoulder strap, with which it is provided. The complete outfit weighs two

ALADDIN READING LENS.

pounds, which includes less than two ounces for the lamp and conducting cords. To further save waste of battery energy, there is a switch on the outside of the leather case for cutting off the current when the lamp is not in use. The battery is said to give light for thousands of readings before requiring renewal.

The lamp and reflector are arranged to amply illuminate the field of the lens. The lens is a high grade reading glass, especially made for reading verniers, etc.

THE WEBER JUNIOR GASOLINE HOIST.

The accompanying illustration shows a gasoline hoist of compact type made by the Weber Gas and Gasoline Engine Company, of Kansas City, Mo. The makers have given to this type the title of the "Junior" hoist. While it is built along the lines of their standard gasoline hoists, its special qualities are its light weight and the fact that for transportation into remote or mountainous country it can be taken apart, no piece weighing more than 200 pounds. It can therefore be carried to any point by burros, if necessary. The hoist is entirely self-contained, and is when shipped complete with all fixtures and attachments. The makers claim that it is easily started and will consume only a pint of gasoline per horse-power hour. It will develop 2½ horse-power when at work, and will raise 600 pounds at a speed of 125 feet per minute.

The machine shown in the engraving occupies a floor space of 9 by 3 feet and weighs 1,200 pounds. The drum size is 10 by 10 inches and the ratio of the gearing is 7 to 1. It is a compact type of machine and appears well adapted for interior mine work or for prospecting.

THE TAYLOR SECTIONAL ROLLS.

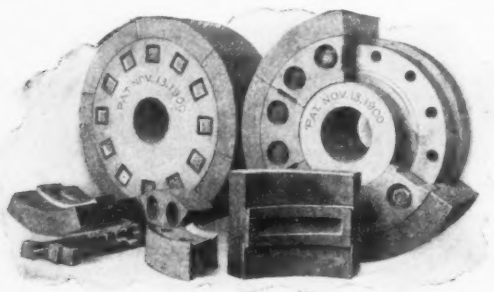
Rolls of various types are used so generally in crushing ore and hard material that any improvement in design is of interest. One of the inconveniences associated with the use of rolls is the necessity of closing down a mill or a section of it when shells have to be changed. When they are in complete rings the rolls and shafts must be lifted out of the bearings and frame in order to get the old shells off and the new ones in place on the centers. It sometimes takes longer to take the rolls out of the frame and put them back than to change the shells, and the loss of time as well as the actual labor cost is a serious item.

Mr. E. W. McCanna, at the time master mechanic of the Anaconda Copper Company, determined to simplify the problem if possible, and after considerable experimenting designed a form of sectional roll which on trial in the Anaconda Works was found to be very satisfactory. He obtained a patent for this design, and this patent is now owned by the Taylor Iron & Steel Company, High Bridge, New Jersey.

As shown in the cut herewith, the shell is divided into several segments, each having a dovetailed rib on the inner side, which fits into a recess in the rim of the center or core and is held by clamp plates or bolts. The shapes of the dovetail and clamping surfaces are such that the shell is securely held in place yet can readily be removed by slacking up the bolts. The segments are not too heavy for two men to han-

dle easily, and as but one segment at a time is put in place and the rolls are not taken out of the frame at all, these two men can do all the work in a very short time at about one-eighth the usual expense of changing shells. These rolls can be made of any desired size and to fit any style of frame.

Should grooving commence, alternate segments of the shell can be changed end for end, breaking up the continuity of the grooves and evening up the surface. In rolls for Chilean and Bryan mills or revolving pans, where there is a tendency to wear unevenly, the segments can readily be turned end for end as often as found desirable, keeping both tire and die ring in proper shape for fine grinding. This method of constructing rolls is particularly suited to



SECTIONAL ROLLS MADE BY TAYLOR IRON AND STEEL COMPANY.

the use of manganese steel shells, as there is no danger of a shell breaking or becoming loose and it is not necessary to bore or grind out the shell for a tight fit as in the ordinary type.

The Taylor Iron and Steel Company is also making a number of specialties in manganese steel that are of much interest to those engaged in mining, milling and reducing ores, dredging for gold, mining and handling coal, coke, etc., crushing and sizing rock for concrete, ballast and macadam. These include concaves and segmental heads for gyratory crushers, plates for jaw crushers, toothed rolls, revolving and flat screens, dredge pins, bushings, bucket lips, tumblers and rollers, steam shovel teeth, mine car wheels and other forms.

METALLURGY BY CORRESPONDENCE.

In early times metallurgy included mining of the ores, production of the metals and metal-working, such as copper beating and founding, gold and silver smithing, etc. Mining soon came to be looked upon as a separate industry, but it was a much longer time before metal working separated from metallurgy and came to be regarded as part of the mechanical trades. Although the meaning of the word metallurgy has been gradually narrowed on one hand, it has been extended on the other, to include chemistry, which was not formerly classed as metallurgical. As now used, metallurgy includes the production of metals from their ores and such operations as are necessary for the preparation of a finished raw materal.

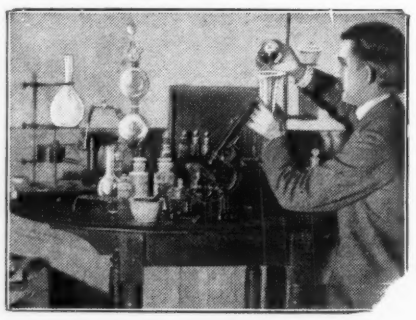
Now that great chemical progress has come to the aid of metallurgy and has brought it to the front rank of the sciences, a thorough scientific training is necessary, in addition to practical experience, to qualify a person for success as a metallurgist.

A complete course in metallurgy embodying the most recent and practical ideas in methods of technical training has just been announced by the International Correspondence Schools of Scranton, Pa. In preparing this course it was assumed (and this is true to all their courses) that the student is able only to read and write, so that the preliminary instruction is elementary in character and is raised to a higher plane by carefully graded steps, thus adapting the course to the needs of those persons whose early education was neglected and equally well to the requirements of those who are further advanced.

All that is required of a metallurgist is to be taught in the course and all non-essential matter is excluded.

A list of the subjects included in the "Complete Metallurgy Course" will give an idea of the educational requirements of a modern metallurgist. The subjects, arranged in the order they are given to the student, follow: Arithmetic, Elementary Algebra and Trigonometric Functions, Mensuration, Mechanics, Steam and Steam Boilers, Steam Engines, Hydraulics and Hydraulic Machinery, Elementary Chemistry, Chemistry and Chemical Operations, Blowpiping, Mineralogy, Assaying, Surface Arrangements at Reduction Works, Ore Dressing and Milling, Sampling Ores, Roasting and Calcining Ores, Cyanide Process, Hyposulphite Lixiviation, Chlorination, Copper Smelting and Refining, Lead Smelting and Refining, Zinc Smelting and Refining and Electrometallurgy.

From these subjects, three shorter courses have been arranged for those who care to study only one



AN I. C. S. STUDENT EXPERIMENTING.

branch of metallurgy. The shorter courses are the Milling Course, the Hydrometallurgy Course, and the Smelting Course. These courses represent the careful work of many specialists who, in choosing the subjects to make up the different courses, selected only those that are necessary for a practical training for practical metallurgists. Subjects that are of value for general culture only are omitted, they being foreign to the purpose of the schools. The aim is to give practical instruction to practical people to help them to understand the principles of their trade or profession so that they may become more proficient in their work and can command higher salaries.

An important feature of the courses is the "Complete Reference Library of Metallurgy," which is furnished to students taking any one of the metal-

AN I. C. S. STUDENT "RECITING."

lurgy courses. The library consists of four handsome and servicable volumes. The subject matter covers every phase of metallurgical work thoroughly and concisely, and is conveniently arranged for reference.

Another feature, and one which will be much appreciated by the metallurgical students, is the blowpiping outfit which is furnished (without extra charge except for expressage) to students of any one of the metallurgical courses. The outfit plays an essential part in the study of minerals and ores and makes its owner practically independent of the professional assayer.

Courses in coal and in metal mining have been offered by the International Correspondence Schools for the past 10 years, but only within a short time has there been a sufficient demand for a special course in metallurgy to justify the schools in preparing, at a considerable expense, a complete and thoroughly practical method of instruction in this important industrial science. This is the first institution of its kind to offer a complete course in metallurgy, and judging from the great success the schools has had in training people for other professions, it will be most successful in the new venture.

PATENTS RELATING TO MINING AND METALLURGY

UNITED STATES.

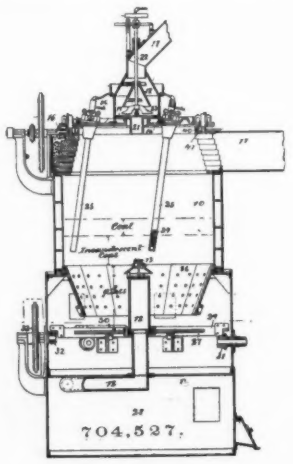
The following is a list of patents relating to mining and metallurgy and kindred subjects, issued by the United States Patent Office. A copy of the specifications of any of these will be mailed by the ENGINEERING AND MINING JOURNAL upon receipt of 25 cents.

Week Ending July 15, 1902.

704,502. DRILL-HOLDING CHUCK-BOLT FOR ROCK DRILLS.—Otto H. Bossert, Denver, Colo. In a drill-holder for rock-drills, the combination with a drill and drill-chuck, of a U-shaped bolt, the members of which pass through holes in the said chuck and are each provided with a notch or recess near their lower end; a yoke having holes through which the depending ends of the bolt are passed, and a keyway at right angles to the said holes, which intersects the same; a key which is passed through the keyway in said yoke and through the notch or recesses in the depending members of the bolt, so as to lock the said yoke upon the said bolt, and a wedge which lies between the connecting members of said U-shaped bolt and the top of the aforesaid clamp-blocks, the said wedge being designed, when driven in one direction, to clamp the said block upon the aforesaid drill, so as to hold the same within the chuck.

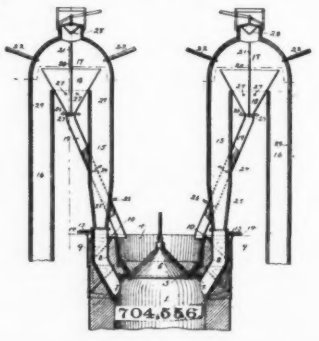
704,504. RETORT GAS-FURNACE.—Frederick Bredel, Milwaukee, Wis. In a recuperator-furnace, the fire chamber or generator, the recuperator and the retort-chamber and retorts mounted therein, protecting-blocks for the retorts nearest the fire-chamber, a primary supply of air-ducts leading into the space below the grate of the furnace, a secondary air-supply through ducts to form combustion and an auxiliary air-supply through ducts situated below and close to supporting-blocks, for the purpose of keeping said blocks cool.

704,527. GAS PRODUCER.—William J. Evans and Frank Klepetko, Great Falls, Montana. The combination of the gas-chamber walls and top relatively rotary, a water seal



between said walls and top, means for confining a body of water upon the said top, an overflow from the said top to the said seal, and an overflow device for the said seal.

704,540. CONVEYOR.—Robert S. Hill, Detroit, Mich.—In combination, a trough, guides thereon, sliding blocks embracing the guides, flights swingingly hung from the blocks, connecting-bars between the flights, and means to reciprocate the flights.



704,556. FURNACE-TOP DOWN-COMER AND EXPLOSION PIPE.—Patrick Meehan, Lowellville, Ohio. A blast-

furnace having a shaft and top provided with a gas-port leading from the furnace-chamber, a down-comer connected to said gas-port, said down-comer projecting upwardly and extending above the furnace-top to a considerable distance and then leading downwardly, and a dust-pipe connected to said down-comer above the furnace-top and leading back to the stack.

704,593. APPARATUS FOR WASHING GASES.—Edward Theisen, Baden, Germany. The combination of a horizontally-arranged stationary casing having liquid receiving and discharge openings, a liquid-container over which the casing rests, said casing and container being so arranged with relation to each other that the mouths of the openings in the former will be submerged in the liquid in the container, a rotary horizontally-arranged externally-bladed cylinder contained within said casing for conveying liquid from the liquid-receiving opening in the casing to the discharge-opening and means carried by said cylinder for continually supplying to the apparatus a washing or absorbing liquid other than that taken from the container.

704,621. PROCESS OF MANUFACTURING ARTIFICIAL MARBLE.—Johann Czermak, Dusseldorf, Germany. A process which consists in forming a series of cracks through the entire thickness of a plastic body, filling said cracks with a differently-colored mass, allowing the mass to set, forming a second series of cracks in the plastic body, and filling said new cracks with a second differently-colored mass.

704,628. PROCESS OF SEPARATING SOLVENTS FROM NITRO COMPOUNDS.—Emil Gathmann, Washington, D. C., assignor to George Whitman McMullen, Picton, Canada. A method of drying nitro compounds consisting in placing the compounds in a sealed vessel, heating and retaining the compound in the vessel in the presence of its solvent vapor until the solvent of the compound is practically liberated therefrom.

704,639. LEACHING AND EXTRACTION OF METALS FROM THEIR ORES.—Carl Hoepfner, Frankfort-on-the-Main, Germany; Henry Orth, Jr., administrator of said Hoepfner, deceased. A process of treating ores and metallic compounds containing copper, which consists in leaching the same with a cupric-chloride solution containing a solvent of cupric chloride in quantity less than is required for saturation, and electrolyzing the resulting cuprous-chloride solution while mechanically separating the electrode solutions, thereby depositing metal at the cathode and converting the cuprous into cupric chloride.

704,640. PROCESS OF EXTRACTING COPPER AND NICKEL FROM SULPHIDE COMPOUNDS.—Carl Hoepfner, Frankfort-on-the-Main, Germany; Henry Orth, Jr., administrator of said Hoepfner, deceased. The process consists in oxidizing roasting copper and nickel sulphide ores or mattes, leaching the sulphate of copper formed, converting this into cupric chloride and then into cuprous chloride, dissolving the nickel salts in the residue by said cuprous chloride, precipitating cuprous chloride from the solution formed and returning the resulting solution containing some cuprous chloride into the cycle of operations.

704,641. PROCESS OF EXTRACTING ZINC OR OTHER METALS FROM THEIR ORES.—Carl Hoepfner, Frankfort-on-the-Main, Germany; Henry Orth, Jr., administrator of said Hoepfner, deceased. A process, which consists in reacting on a material containing an oxygen compound of metals insoluble in water and whose chlorides are soluble in a solution of alkali-metal chloride, with sulphurous acid and an aqueous solution of alkali metal chloride, whereby a solution is formed containing a chloride of a metal.

704,649. ELECTRICAL FURNACE FOR TREATING HIGHLY REFRACTORY SUBSTANCES.—Hudson Maxim, Brooklyn, N. Y. In an electrical apparatus for making calcium carbide, an electrical circuit, a carbide conductor included in said circuit, whereby said conductor is maintained incandescent, means delivering carbide-forming materials to the heating-field, and means uninterruptedly moving the calcium carbide from the heating field as fast as formed.

704,650. PULVERIZING MILL.—George S. Maxwell, Madison, N. J., assignor of one-half to H. D. Crippen, New York, N. Y.. The combination with a free ring, of two rolls. supporting said ring, a driving-roll engaging with said supporting-rolls, and means for rotating the driving-roll.

704,675. PROCESS OF RECOVERING METALLIC TIN.—David H. Browne, Cleveland, Ohio, and James M. Neil, Toronto, Canada. A process of extracting tin from materials containing the same, which consists in subjecting the material to a solution of ferric chloride, thereby forming a solution of chloride of tin and ferrous chloride, and precipitating the tin from such solution by an electric current passing between an insoluble anode and a suitable cathode.

704,717. ARTIFICIAL FUEL AND METHOD OF PREPARING SAME.—Bertrand M. Thomas, San Francisco, Cal. An artificial fuel composed of tule peat and crude petroleum mixed with an alkali earth.

704,740. EXCAVATING AND LOADING APPARATUS.—Washington Fogelsong, Dayton, Ohio, assignor of one-half to John Collins, Dayton, Ohio. The combination with a main frame, of supporting and driving wheels therefor, a motor carried by said frame and connected with the driving-wheel, a scoop-supporting frame pivotally mounted on said main frame, a scoop connected to said pivoted frame, a cam-shaft provided with cams for engaging said pivoted frame to raise and lower said scoop and connections between the motor and said cam-shaft.

704,754. MACHINE FOR MOLDING BRICKS.—Julius Mohs, Brandenburg, Germany. The combination of a mold with a plunger, a webbing situated on the lower surface of said plunger, a frame provided with several ribs situated behind said webbing, a second plunger arranged within the first one also provided with several ribs adapted to fit between the ribs of the first plunger.

704,782. AIR-PRESSURE REGULATOR.—Joseph H. Dickinson, Detroit, Mich. An air-pressure regulator comprising a collapsible bellows having an elongated exhaust-port, a valve pivoted at one end adjacent to said port and a connection between the opposite end of said valve and the movable wall of the bellows adapted to cause the gradual closing of said port by the collapsing of the bellows.

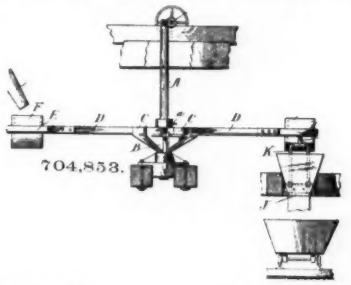
704,793. PLATING METAL.—William Griffith, Pittsburg, Pa. A method of plating, iron, steel, and other metals with a different metal, such as copper or other metal or alloy, consisting in covering the surface of the metal to be plated with the coating metal or alloy in a pulverized condition, placing a plate of the coating metal on the pulverized metal, heating the metals, and subjecting them to pressure.

704,831. PROCESS OF MANUFACTURING SULPHURIC ACID FROM SULPHUR DIOXIDE IN AQUEOUS SOLUTION BY ELECTROLYSIS.—Charles B. Jacobs, East Orange, N. J., assignor to the Ampere Electro-Chemical Company, Jersey City, N. J., a corporation of New Jersey. A process of making sulphuric acid, which consists in passing sulphur dioxide through a porous anode and setting free the oxygen of water by electrolysis upon said anode.

704,832. CHECK-LOCK FOR MINE-CARS.—Levi J. Joder, Meyersdale, Pa. The combination with a car having an opening in its body portion above the floor thereof, of a check or similar token, a ring connected to the check or token and inserted through the opening in the side of the car, and a hook pivoted to the side of the car and swinging in a vertical plane downwardly to engage said ring and lock the same in place.

704,849. CEMENT.—James T. McKim, Thorntown, Ind., assignor of one-half to Lewis Miller, Thorntown, Ind. A cement composed of Portland cement, sand, calcareous ocher, iron-ore paint and litharge.

704,853. ORE SAMPLER.—Sidney E. Brotherton, Denver, Colo. An ore-sampler consisting of a vertical shaft and means for rotating it, a spider adjustable on the supporting-shaft and having radiating arms detachable therewith as

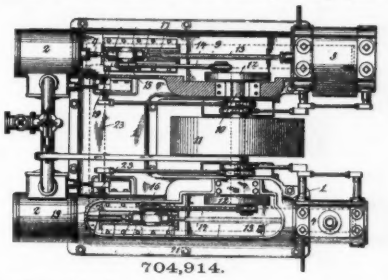


specified, the said arms carrying at their free ends balanced buckets having projections for engaging a fixed tripper device dumping the buckets, and the buckets having a stop device permitting it to swing in one direction only beyond its balanced position.

704,886. APPARATUS FOR DRYING AND DISTILLING WOOD, SAWDUST, PEAT, OR THE LIKE, AND FOR TREATING OTHER SUBSTANCES.—Eduard Larsen, Copenhagen, Denmark. In an apparatus of the character described, an inner shaft, an outer shaft surrounding said inner shaft, a drying-chamber arranged in the upper portion of said inner shaft, a distilling-chamber arranged in the lower portion of said inner shaft, a port-chamber interposed between said drying and distilling chambers, means for establishing communication between said port-chamber and said drying-chamber, and means for establishing communication between said distilling-chamber and sad port-chamber.

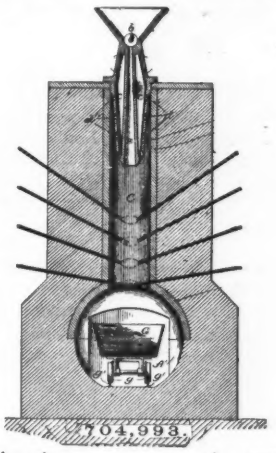
704,900. DUST-COLLECTOR.—John E. Mitchell, St. Louis, Mo. In a dust-collector, a series of corrugated filtering-surfaces, a cleaner therefor, and means for moving said cleaner successively into contact with said surfaces.

704,914. COMPRESSOR.—Frederick W. Parsons, Elmira, N. Y., assignor to Rand Drill Company, New York, N. Y., a corporation of New York. In a fluid-compressor, the combination with two power-cylinders arranged side by side, two compression-cylinders also arranged side by side, and each in line with one of the power cylinders, pistons for said cylinders, piston rods connecting pistons in opposite cylinders, and a sliding cross-head for each of said piston-rods, located between the corresponding cylinders, and each provided with an inwardly projecting wrist-pin, of a cross-head guide for each of said cross-heads, having upper, side and lower bearing portions coacting with corresponding portions of its cross-head, whereby lateral stress upon the cross-head, in every direction, is resisted, a transverse crank-shaft intermediate of said cylinders, a fly-wheel thereon, and a connecting-rod connecting each said wrist-pin with said crank-shaft, said connecting-rods each arranged eccentrically of the axis of its corresponding pistons and



piston-rod, and to have a path of movement to one side of the path of movement of the said piston-rod.

704,993. ELECTRIC SMELTING-FURNACE.—Frederick C. Weber, Chicago, Ill. In an electric smelting-furnace, the combination of a horizontally-elongated furnace-chamber, several superposed series of electrodes projected laterally into the furnace from opposite sides thereof, each series having a different angle of downward convergence in



relation to the other series and toward a central space with an arcing space between the companion downward-converging electrodes of each series and forming an extended horizontal arcing space downwardly projected between the several superposed series of electrodes, and a feed or discharge for the material from above in direct line with the arcing space.

12,010. EXCAVATING-MACHINE.—Hans J. Bentson, Chicago, Ill., assignor to Frederick Howard. The combination with a shaft journaled in bearings on the frame of the machine and carrying parallel sprocket-wheels of a frame swinging on an axis coincident with the axis of rotation of said shaft and adapted to depend therefrom, a shaft journaled in bearings on the free end of said frame, sprocket-wheels carried by said shaft, parallel sprocket-chains turned over said sprocket-wheels on both said shafts, scraper-plates carried by said chains, and an apron depending loosely from said frame of said machine and adapted to rest at its lower end upon the ground immediately in advance of the ditch, said apron being adapted to prevent the earth carried upwardly by said plates from leaving same at their point of exit from the ditch.

GREAT BRITAIN.

The following is a list of patents published by the British Patent Office on subjects connected with mining and metallurgy:

Week Ending June 19, 1902.

14,433 of 1901. PICK.—F. Nelson, Sheffield. Improved socket for holding pick heads.

14,812 of 1901. PURIFYING BRINE.—G. N. Vis, Basle, Switzerland. Process for removing lime salts from brine by precipitating with magnesium salts.

16,122 of 1901. ELECTRIC FURNACE FOR ZINC.—A. Dorsemagen, Aachen, Germany. Electric smelting furnace for smelting zinc oxide, silicates and carbon, so producing silicide of carbon and metallic zinc.

16,337 of 1901. TREATING NICKEL COPPER ORES.—Siemens & Halske, Berlin, Germany. A process for converting manganese, nickel and copper ores into sulphates by heating and passing sulphurous acid and air over them.

20,202 of 1901. BLAST HEATER.—E. Bosshart, Cologne, Germany. In furnaces for reheating wrought iron, methods of heating the air blast.

25,453 of 1901. WATERING COAL DUST IN MINES.—J. Williams, Glamorgan. A watering tank for mines, the hose being worked by cogs on the wheels.

2,326 of 1902. MINE CAR COUPLER.—T. J. Thomas, Neath. A safety lock on shackle bolt for coupling colliery cars.

3,834 of 1902. BLAST FURNACE CHARGER.—F. C. Roberts, Philadelphia, U. S. A. Improvements in apparatus for charging blast furnaces.

9,521 of 1902. CONCENTRATOR.—H. E. T. Haultain and H. R. Stovel, Nelson, B. C. A plant for concentrating ores by the addition of oil to the pulp.

to Promote Business," and "Special Applications of Acetylene."

The usual supper will be on Tuesday evening, August 12.

INDUSTRIAL NOTES.

The Sharon Boiler Works, of Sharon, Pa., has a large force of men at the plant of the Colorado Fuel and Iron Company, at Pueblo, Colo., erecting new blast furnaces.

The Coatzacoaloos Light and Power Company, of Coatzacoaloos, Mex., has ordered of Church, Kerr & Company a complete air pump and condenser outfit in connection with its power plant.

The Vulcan Iron Works, of Seattle, Wash., is putting in new foundry equipment and will soon be ready to turn out mining machinery more quickly and in larger quantities than ever.

The damage done by the recent fire at the plant of John A. Roebling Sons' Company at Trenton, N. J., was about $100,000. The principal loss was in the braiding shop, which contained a large amount of machinery.

Graham Brothers of Stockholm, which concern looks after the interests of several American manufacturers of machinery, etc., in Sweden, has placed a contract with Westinghouse, Church, Kerr & Company for 2 large compound engines.

The Burt Manufacturing Company, of Akron, O., has just filled an order for 28 Cross oil filters and 111 Burt exhaust heads to go to its agency in London, Eng. The shipment made one solid carload. This is thought to be the largest single order of oil filters and exhaust heads ever placed by one concern.

W. B. Schaffler, Nazareth, Pa., is at the head of a company that is to build a cement plant at Martin's Creek, Pa., which will have a capacity of about 2,500 bbls. per day. The plant will consist of an engine room 60 by 100 ft., boiler house 60 by 90 ft., mill building 102 by 174 ft., and stock house 80 by 380 ft., etc.

Franklin furnace at Clinton, N. Y., is again in blast. It is now controlled by Buffalo men, having passed out of the hands of the Franklin Iron Manufacturing Company. Hanna & Company, of Cleveland, O., leased it 2 years ago, but kept it in blast only a few months. The output will be about 90 tons of pig daily.

The Joshua Hendy Machine Works, of San Francisco, Cal., has lately installed a complete electrical plant for the Duplex Mining Company at Searchlight, Nev., with sufficient capacity for lighting and drilling purposes. The firm has also shipped a large 2-cylinder 2-drum hoisting plant to the Tyee Mine on Vancouver Island, B. C.

The Lukens Iron and Steel Company, of Coatesville, Pa., intends to erect blast furnaces. The stockholders have taken out a West Virginia charter for a company, to be known as the Lukens Coal Company, and have purchased gas coal property near Clarksburg. The mine will be equipped with modern pneumatic machinery and the output will be about 1,000 tons a day.

Among the orders recently booked by the Harrisburg Foundry and Machine Works, of Harrisburg, Pa., are: A 300-h. p. engine for the Myles Salt Company, at Weeks, La.; 2 300-h. p. Harrisburg standard compound direct connected engines for the new shops of the New York Central & Hudson River Railroad at Oak Grove, Pa., and a 200-h. p. engine for the Spartan Mills, at Spartansburg, S. C.

The Pioneer Iron Company, of Marquette, Mich., is rushing work at its new furnace plant in North Marquette. A large gang is at work putting in sidetracks, of which about 4 miles will be necessary for ore and other cars and yard work. The large trestles to the steel ore pockets are nearly finished and the large cedar posts are all driven. The framework for the ore pockets themselves is about finished. The charcoal-making department is to be very complete.

For the Susquehanna Iron and Steel Company's new plant at Columbia, Pa., the Pittsburg Gage and Supply Company, of Pittsburg, Pa., will furnish 3 250-h.p. water tube boilers. The Pittsburg Gage and Supply Company has recently closed contracts with the National Steel Company to furnish a complete White Star filtering system for a vertical cross compound blowing engine, also filtering systems for the Electric Department of the Carnegie Steel Company, Homestead Works, and for the Wheeling Steel and Iron Company, Wheeling, W. Va.

In the United States Circuit Court at Boston, Mass., last week the Central Trust Company of New York City brought a bill against Henry M. Whitney and others, trustees of the New England Gas and Coke Company, seeking to have the first mortgage declared foreclosed because of a default in the payment of interest on the bonds for $17,500,000, and to have receivers appointed to take possession of the property included in the mortgage. The property consists of the entire plant of the Gas and Coke Company. A subpoena was issued. This action will be joined later to the receivership case now pending.

The Arthur Fritsch Foundry and Machine Company, of St. Louis, Mo., reports great activity at its works. The orders in hand consist largely of mining machinery. The firm has just added a new pattern room and erecting shop at the extreme western end of the plant and the Fritsch Company now occupies the whole half block from Gratiot to Lombard streets, with the exception of a small corner on Gratiot street. The company is having one of the most prosperous seasons, it is stated, since it started in business, and has several big orders under negotiation. It has a large order for plate glass machinery for the plant of the St. Louis Plate Glass Company, at Valley Park, Mo., and also has an order for high-grade rolls for a mining enterprise in California.

The Buffalo Forge Company, of Buffalo, N. Y., reports the following orders recently received from its branch houses: Two 70-in. steel plate steam fans, for heating and ventilating, direct connected to 2 Buffalo Forge Company engines, and a 130-in. ¾ housing standard steel plate pulley fan for mechanical draft to be shipped to Copenhagen, Denmark; an induced draft plant and a 23-h.p. engine for an electric light plant in Dutch Guiana; 5 engines of 45 h.p. each for driving generators, and 1 38-h.p. engine for a pumping equipment to Manzanillo, Cuba; 1 20-h.p. vertical class "A" engine to Gustenunde, Germany; 1 15-h.p. double vertical single acting engine to Gothenburg, Sweden; 1 60-in. standard steel plate fan to near Glasgow, Scotland; 1 standard 80-in. fan and heater complete, 1 90-in. pulley fan and 1 30-h.p. horizontal engine to London, England; 1 80-in. standard steel plate fan to Victoria, B. C.; 1 110-in. steel plate pulley fan direct connected to engine, to Halifax, N. S.; a 70-in. fan and a 100-in. fan to Portland, Ore.; a 100 in. steel plate fan direct connected to engine, to San Francisco, Cal.; 2 special 60-in. steel plate fans, to New Orleans, La.

Among other engine sales of the Allis-Chalmers Company for June, 1902, were: Brown, Cary & Woodruff Company, Salt Lake, Utah, 12 by 36-in. 1890 frame Reynolds Corliss engine; Tyee Copper Company, Ladysmith, Vancouver Island, 14 by 36-in. girder frame Reynolds Corliss engine; Kioto Traction Company, Kioto, Japan, 16 and 32 by 36-in. 1890 frame cross-compound direct-coupled Reynolds Corliss engine; Virginia-Carolina Chemical Company, Richmond, Va., one 16 by 42-in. and one 20 by 42-in. girder frame Reynolds Corliss engine; Janesville Cement Post Company, Janesville, Wis., 14 by 36-in. girder frame Reynolds Corliss engine; Twin City Rapid Transit Company, Minneapolis, Minn., 46 and 94 by 60-in. vertical cross-compound direct-coupled Reynolds Corliss engine (third order); West Allis Malleable Iron and Chain Belt Company, West Allis, Wis., 12 by 30-in. girder frame Reynolds Corliss engine; London United Tramways, London, England, 26 and 54 by 48-in. vertical cross-compound direct-coupled Reynolds Corliss engine (second order); Pennsylvania Railroad Company, Pittsburg, one Riedler air compressor with air cylinders 15 and 24 by 36 in., driven by cross-compound non-condensing Corliss engine with steam cylinder 14 and 24 by 36 in.

The reorganization of the firm of Jones & Laughlins, Limited, as the Jones & Laughlins Steel Company, has been perfected. The capital will be $30,000,000, an increase of $10,000,000, and provision has been made for the issue of $10,000,000 of bonds, to be used for enlargements and improvements. The new corporation will begin on August 1. It is understood that the new company, being one of the largest independent steel concerns in the country, may become an aggressive competitor of the United States Steel Corporation. The directors are B. F. Jones, Henry A. Laughlin, George M. Laughlin, James Laughlin, Jr., and B. F. Jones, Jr., who have been members of the advisory board; Willis L. King, William Larimer Jones, Thomas O'Connor Jones, Irwin B. Laughlin, J. B. Laughlin, W. C. Moreland and Roland Gerry, who have been members of the board of managers, and W. W. Willock, who has had charge of the Monongahela Connecting Railroad; Robert Geddis and Henry S. Kiehl. B. F. Jones, Jr., who has been chairman, will become president; Willis L. King, who has been vice-chairman, will be vice-president; W. L. Jones will continue as general manager; Irwin B. Laughlin, treasurer; T. K. Laughlin, assistant treasurer; W. C. Moreland, secretary, and Wendell Van Hook, auditor.

Westinghouse, Church, Kerr & Company have recently booked a number of orders of considerable importance for products through their several foreign representatives. Among these may be mentioned: Indwe Railway, Coal and Land Company, Cape Colony, South Afica, a complete railway system for the DeBeers Mines, Cape Colony. This equipment comprises 2 250-h.p. compound single-acting engines direct connected to Westinghouse generators, for furnishing current to 6 Baldwin-Westinghouse mining locomotives. Juan Martinez, Linares, Spain, has ordered a 125-h.p. 3-cylinder gas engine operating on producer gas, and belted to 2 37.5 kw. Westinghouse generators for power purposes. The Montezuma Lead Company, Santa Barbara, Mex., has ordered a 75-h.p. compound engine. Graham Brothers, Stockholm, Sweden, have ordered 2 200-h. p. compound engines for power purposes. Takata & Company, Tokio, Japan, have ordered a 150-h.p. compound engine. The De Beers Consolidated Mines Company, Limited, Cape Colony, has ordered 2 1,000-kw. turbo-generators to be delivered the first part of the coming year. The "Steam Loop and Holly Gravity Return System" has had many new applications abroad, prominent among which are the works of La Gran Fundicion Central Mexicana, Aguas Calienta, Mex., and the immense works of the British Westinghouse Electric and Manufacturing Company, Manchester, England. At these works will also be installed several large Roney stokers in addition to the present equipment. Roney stokers will also be installed in the power plant of the Mersey Railway, this order covering 7 158-in. by 28 in. grates and 2 136 in. by 24 in. grates.

TRADE CATALOGUES.

Robert Delarue, of Dieppe, France, for whom B. Voight, of 132 Front street, New York City, is sole agent for United States, Canada and Mexico, issues a circular showing the different sizes of pebbles he is prepared to furnish for tube mills.

Gauag, Gockel & Co., of Overlahnstein-on-the-Rhine, Germany, issue a little pamphlet, giving the names of important public works, such as bridges, dams and railroads, also of industrial plants of various kinds on which their elevating machinery cranes and concrete mixers have been employed during construction.

The Rand Drill Company, of New York City, issues a finely illustrated folio pamphlet of 56 pages describing in considerable detail the construction of the New York Rapid Transit subway. The pamphlet shows the different systems of handling rock and earth by the various contractors on this important work, and is of decided interest. It is intended to illustrate the uses and applications of Rand drills and Rand air compressors in centralized air-power plants.

Eckhardt, Sondermann & Co., Herdecke, Westphalia, Germany, publish a booklet of 154 pages describing the various patterns of shovels, spades and scoops they manufacture. The descriptions in the pamphlet are printed in German, but the index is printed in German, English, French and Spanish. No less than 233 different types of spades, shovels and scoops are described, including a number of American designs. The pamphlet gives dimensions, weight and other details.

Section 2 of the 1902 catalogue of mining machinery published by the Holthoff Machinery Company, of Cudahy, Wis., is an illustrated pamphlet of 56 pages describing the company's boilers and sheet-metal work. The company states that it uses flange steel and the best quality of rivets in the construction of its boilers, and, if desired, will furnish a manufacturer's guarantee that any sheet will bend down cold without fracture after heating to a cherry red and plunging in cold water. The company manufactures boilers of various types, but calls attention particularly to its internally fired boilers with Morrison's corrugated suspension furnaces, built in sizes of 75 to 300 h. p. and for pressures of 100 to 300 lbs. per sq. in. The company points out these advantages, among others, of internally fired boilers: fuel economy, limited floor space required, portability, accessibility of interior for cleaning, safety and low maintenance cost. The Holthoff Machinery Company manufactures steam drums and air receivers, steel tanks for all purposes, copper converters, steel water-jacket furnaces, steel stacks and riveted pipe, ore buckets and skips and mine cars.

The Oakland Iron Works, of Oakland, Cal., issues a catalogue of 144 pages describing the Tuthill patent water wheels, motors and governors. The Tuthill wheels are of the tangential type, their distinguishing characteristic being the shape of the buckets, which are designed to take the entire jet without dividing the stream. They are arranged in rights and lefts. This arrangement, it is stated, besides preserving the water of the jet undivided throughout, gives a discharge on alternate sides of the wheel, thus preventing any loss of efficiency from the backlash of the waste water. The pamphlet contains illustrations of Tuthill wheels as installed by mining and irrigation plants. The Tuthill water-wheel governor is stated to be original, simple and practically instantaneous in action. It contains no delicate parts and in service has been subjected to violent changes of load, 20 per cent variations in load not increasing the speed of the wheel instantaneously more than 3 per cent from normal. The pamphlet contains a long list of names of users of Tuthill wheels, gives numerous tables of use to those contemplating the development of water power, and is, in its way, an excellent publication.

PERSONAL.

Mr. George M. Seeley has resigned the superintendency of the Irondale Lead Company, of Irondale, Mo.

Mr. Leo Von Rosenberg leaves New York City this week to examine mines in Colorado, California and Mexico.

Mr. C. O. Baxter, president of the Gibson Asphaltum Company, of St. Louis, Mo., has been in Salt Lake, Utah.

Mr. George H. Robinson has returned to Salt Lake, Utah, from a business trip to London, and is now in Butte, Mont.

Mr. A. G. Stephens, a metallurgist from the Black Hills, S. Dak., is making a business trip to Gilpin County, Colo.

Mr. C. A. G. Winther, superintendent of the Chapman Valve Company, has been elected a director of that corporation.

Mr. R. H. Campbell, formerly of Shasta County, Cal., is examining placer property on Eureka and Fraser Creeks, B. C.

Mr. N. S. Berray, superintendent of the United Globe Mines, returned recently to Globe, Ariz., from Grant County, N. M.

Mr. F. L. Bosqui is now at Jardine, Mont., where he is constructing a large cyaniding plant for the Bear Gulch Mining Company.

Mr. C. J. Wrisberg, of St. Louis, Mo., has been visiting the Bon Homme Mine at Burrows Park, Colo., in which he is interested.

Dr. Robert M. Bird, at present at the Mississippi Agricultural College, has been made acting professor of chemistry at the University of Missouri.

Mr. Wallace McGregor returned recently to Berkeley, Cal., after spending a year at mines in Costa Rica, and is now at East Braintree, Mass.

Mr. Frank Nicholson, mining and consulting engineer, of Joplin, Mo., sails for Europe August 2 on professional business and will be gone about 2 months.

Mr. J. C. Kortz, of Ohio, president of the Ohio & Colorado Smelting and Refining Company, recently inspected the work at the new smelter at Salida, Colo.

Mr. Randolph Adams, general manager of the Tennessee Copper Company, is absent on a 3 months' vacation, during which time he will visit the principal copper districts of the West.

Prof. J. R. McCall, for 12 years professor of mechanical engineering at the University of Tennessee, has accepted a similar position with the Purdue University, at Lafayette, Ind.

Mr. A. H. Raymond has been appointed sales agent in charge of the Division Sales Office of the coal companies controlled by the Missouri Pacific Railroad at Kansas City, Mo., vice Mr. W. A. Graves, resigned.

Mr. H. M. Clagett, formerly superintendent at Vacas, Durango, Mex., has been appointed superintendent of the mill and smelter of the Pride of the West Mining and Milling Company at Washington, Ariz.

Mr. Frank Draper, who is a professor in the Missouri School of Mines at Rolla, Mo., has been visiting his brother, Mr. M. D. Draper, of the Town Topics Mining Company, operating near Central City, Colo.

Mr. J. Parke Channing, consulting mining engineer of New York City, is at present at Copperhill, Tenn., in charge of the plant of the Tennessee Copper Company during the absence of Mr. Randolph Adams, the general manager.

Mr. W. B. Wier has been appointed sales agent in charge of the Division Sales Office at Fort Smith, Ark., of the Missouri Pacific and Missouri and Kansas & Texas Coal companies, vice Mr. A. H. Raymond, transferred to Kansas City.

Mr. E. C. Englehardt is making good progress with the alterations at the old Harrison Smelter at Leadville, Colo., for the Gold-Copper Reduction Company, of New Jersey, and expects to start treating the enormous slag dump before long.

Mr. R. Schorr, late of the Shannon Copper Company, Clifton, Ariz., and Mr. A. C. Paulsmeier, late of the Risdon Iron Works, San Francisco, have formed a partnership and opened an engineering bureau at 206 Sansome street, San Francisco, Cal.

Mr. W. H. Hackett, mining engineer, who has been for the past 5 years in charge of the Andes Mining Company's mines and works in San Juan Province, Argentina, has returned to the United States and is stopping at No. 265 West Twenty-third street, New York City.

Mr. Arthur Weston and Mr. Joel L. Vaille, who represents the interests of Coates Brothers, the thread firm of Paisley, Scotland, were visitors in Gilpin County, Colo., last week looking at the Haseltine property in the Russell District, which is being developed for the Scotchmen.

Mr. Philip Argall, mining and metallurgical engineer, of Denver, Colo., is at present examining the Rosario Mine, at Guadalupe y Calvo, Mex., and investigating the milling of its ores. Messrs. A. W. Warwick, John R. Mitchell and C. A. Hoyt, accompany Mr. Argall as assistants.

Mr. Charles Weider, formerly superintendent of the Moose Mine, at Cripple Creek, and more recently superintendent of the Independent Company at Crestone, has been appointed superintendent of the Brown-Pullen-Mayhew lease on the Jerry Johnson on Iron Clad Hill, Cripple Creek, Colo.

Messrs. M. A. Hudson and H. S. Whitney, formerly with Manning, Maxwell & Moore, have been appointed associate managers of the New York office of the Payne Engineering Company. Mr. C. Lawrence, formerly with the New Jersey Telephone Company, has been appointed resident engineer.

Mr. Frank Schuyler, the Trent Machinery Company's millwright, has returned to Salt Lake, Utah, from a 3 months' trip to Silverton, Colo., where he has been building a 100-ton concentrator for the Gold Tunnel Railroad Company, a Toledo, O., combination, which owns a silver-lead property.

Mr. Ferd. H. Regel, secretary of the Arthur Fritsch Foundry and Machine Company, of St. Louis, Mo., is on an extended tour of the Western States in behalf of his company. Mr. Regel will visit mining and other centres in Colorado, Utah, Idaho, Montana, Washington, Oregon, New Mexico, and California.

Mr. R. D. Hunter, manager of the Denver office of the Sullivan Machinery Company, is on his way to South Africa, where he will spend several months examining the entire South African field in the interests of his company. During his absence the Denver office will be in charge of Mr. W. P. J. Dinsmoor.

Mr. R. B. McConney, of Denver, Colo., for many years connected with the Mine and Smelter Supply Co., as mechanical engineer, has accepted a similar position with the Holthoff Machinery Company, of Cudahy, Wis. Mr. J. W. Gates, of the Salt Lake City branch of the former concern, succeeds Mr. McConney.

Mr. A. B. Cousin, secretary and manager of the St. Helens & Galice Mining Company, of Portland, Ore., is in Chicago and Eastern points conferring with stockholders as to the advisability of purchasing property adjacent to their own on Galice Creek upon which the company has options. Mr. Cousin is heavily interested in Southern Oregon mines.

Mr. F. E. Now, formerly purchasing agent of the Cleveland, Lorain & Wheeling Railroad, has been appointed purchasing agent of the Pittsburg Coal Company, at Pittsburg, Pa., to succeed Mr. W. A. Dinker, resigned. Mr. F. H. Stark, formerly general car foreman of the Baltimore & Ohio Railroad, at Baltimore, Md., has been appointed superintendent of motive power of the Pittsburg Coal Company.

Mr. J. S. Cunningham, of Moxham, Pa., has resigned his position as superintendent of the Berwind-White Coal Mining Company's operations at Windber and is now in West Virginia in the interest of Mr. Berwind, the company having extensive operations in that State. Mr. Cunningham is succeeded by Mr. Charles S. Sharpless, who for several years had been assistant superintendent at Windber. While Mr. Cunningham, though he has resigned as superintendent, still retains the position of consulting engineer of the operations at Windber.

Mr. W. J. Olcott, who has been superintendent of Mesabi Range mines for the United States Steel Corporation, has been made manager of mines for the corporation, his duties covering all ranges. Mr. L. W. Powell, who has been agent for the Oliver Iron Mining Company, has been made assistant to President T. F. Cole, of mining companies of the corporation. Mr. W. A. McGonagle, who has been assistant chief engineer for the Duluth & Iron Range Road, has been made general manager for the Duluth, Mesabi & Northern. All the above will have offices at Duluth.

Governor Van Sandt of Minnesota has appointed the following delegates to represent the State at the International Mining Congress in Butte: J. S. Harding, S. E. Hepps, Glenn R. Brown, C. E. Bailey, and C. W. Kimberly, of Eleveth; P. Mitchell, Capt. Redfern and A. P. Silliman, of Hibbing; E. C. Mills and J. D. Lamont, of Virginia; Capt. J. W. Wallace, Duluth; J. D. Shilling, Biwabik; C. H. Munger, Sparta; M. S. Hawkins, Mountain Iron; John Pengilley, Ely; C. H. Pratt, Boise, Idaho; J. C. Riebe, Dr. O. B. Bachman, Fred. J. Bowman, C. R. Hall, of Minneapolis; B. H. Evans, N. C. Nesterfield and Dr. N. Lehnen, of St. Paul.

Governor Bliss, of Michigan, has appointed the following delegates to the International Mining Congress: C. M. Boss, Bessemer; Walter Fitch, Beacon; J. D. Cuddihy and Josiah Hall, Calumet; Z. W. Wright, R. R. Goodell, A. R. Rees and A. R. Gray, Houghton; C. A. Wright, Hancock; J. B. Cooper, S. Lake Linden; Tom A. Hanna, Iron Mountain; Dr. George W. Orr, Lake Linden; R. M. Randall, Saginaw; F. G. Benham, Saginaw; E. B. Foss, Bay City; Charles Chynoweth, Calumet; Robert L. Edwards, Dr. L. L. Hubbard and F. J. Bawden, Houghton; W. A. Bateman, Calumet; W. H. Hoskins, Calumet; John E. Jones, Lake Linden; M. R. Goldsworthy, Hancock; Charles Smith, S. Lake Linden; F. McM. Stanton, Atlantic Mine; James N. Cox, James McNaughton, W. E. Parnell, John Duncan, Calumet; R. H. Shields, Hancock.

The following delegates have been appointed to the International Mining Congress at Butte, from Iowa: Harry Booth, Knoxville; H. L. Byers, Morgan Valley; George Ramsay and W. T. Phillips, Oskaloosa; John Donovan, What Cheer; T. J. Phillips, Ottumwa; J. A. J. Powers, Busse; Jerry Dawson, Kallo; F. E. Wilson, Webster City; William Crowe and Col. Henry Canfield, Boone; David Reece, Panora; Samuel Ballentyne, Boonesboro; George Richards, Colfax; Charles Morris, James E. Stout and Prof. Floyd Davis, Des Moines; J. M. Tupper, Colfax; John P. Reece, Albia; John P. White, Albia; Thomas E. Lee, Centerville; David Ludwick, Mystic; Alex. Dargavel, Centerville; B. C. Buxton, Muchakinoca; H. Findley, Douds; J. E. L. Courtney, Perlee; Peter Thomas, Seymour; A. C. Lundsford, Lundsdale; Roderick Campbell, New Market.

SOCIETIES AND TECHNICAL SCHOOLS.

WASHINGTON UNIVERSITY.—The following announcements were made at the recent commencement exercises: Robert Heywood Fernald, professor of mechanical engineering in place of Prof. J. H. Kinealy, who resigns to go into the practice of his profession in Boston; Sherman Leavitt and Samuel W. Forder, instructors in chemistry, to take the place of Gellert Alleman, who becomes professor of chemistry in Swarthmore College. P. R. Goodwin was appointed instructor in civil engineering.

HARVARD UNIVERSITY.—A new publication, the *Harvard Engineering Journal*, devoted to the interests of engineering and architecture at the University, has made its appearance. It is published by the Harvard Engineering Society. The first number contains a history of engineering at Harvard; a description of Pierce Hall, the new engineering building; an article on instruction in engineering at Harvard, and a description of the steam loop and Holly gravity return system. The magazine is neatly printed and ably edited and compares favorably with any of its class.

AMERICAN FORESTRY ASSOCIATION.—This association will hold a special summer meeting at Lansing, Mich., on August 27 and 28. Headquarters will be at the Downey Hotel. At the close of the afternoon session on August 28 a special train will be provided, without cost to the members of the association, to convey those who desire to accompany the excursion to the Michigan Forestry Preserve in Roscommon and Crawford counties, by way of Saginaw and Bay City. From this point the excursion will proceed to the hardwood forests in Antrim County, thence to Mackinac Island.

UNIVERSITY OF BIRMINGHAM.—This institution, at Birmingham, England, issues a little 10-page pamphlet, a syllabus of its classes in mining. The pamphlet calls attention to the situation of Birmingham near the Midland coal-fields and the opportunities that will be afforded students for instruction in coal mining. Further, the mining department will be furnished with materials and apparatus for the teaching of metal mining, and the student will be able during special weeks in the year to visit at no great cost the mining districts of Wales and Cornwall. The course of instruction contemplates weekly visits to mines near Birmingham, and a month or 5 weeks each summer will be given to the study of some group of metalliferous mines in Britain or abroad. The course is intended for those who intend to become practicing and consulting mining engineers, colliery managers, managers of metal mines, teachers of mining, mine surveyors, land and estate agents or owners of mineral lands. The course of study covers a period of 3 years.

INTERNATIONAL ACETYLENE ASSOCIATION.—The postponed meeting will be held in Chicago, Ill., August 11, 12 and 13 in the assembly room of the John Crerar Library, corner of Washington street and Wabash avenue. The programme as arranged is as follows: "Foreign Acetylene Associations and Their Work," Elias A. Long, Chicago; "Acetylene Progress on the Pacific Coast," Percy W. Rochester, San Francisco, Cal.; "Town Lighting from Automatic Generators," W. W. Turner; "A Review of the Burner Situation," Messrs. J. B. Carroll, Chicago; M. Kirchberger, New York City; H. E. Shaffer, Rochester, N. Y., and R. B. Steward, Chattanooga, Tenn.; "Acetylene Wrinkles," C. E. Ummach, Chicago; "Car Lighting from Independent Acetylene Generators," E. P. Caldwell, Chicago; "Acetylene Possibilities at the Louisiana Purchase Exposition," A. E. Schlieder, Omaha, Neb.; "Recent Developments in the Use of Acetylene Under Pressure," J. M. Morehead, Chicago; "Insurance as Related to the Acetylene Generator Manufacturer," L. J. Wing, New York City; "Purification and Its Real Value," "Meters and Their Use

closed down until September on account of the heat. Eighty men are employed.

SAN DIEGO COUNTY.

(*From Our Special Correspondent.*)

Bailey Brothers.—A Los Angeles company is arranging to bond this mine, at Banner, a few miles from Julian.

Golden Cross.—This mine, at Hedges, known as the Free Gold, has been in the hands of a receiver for some years. It is now thought that as the conflicting interests have settled their differences work soon can be carried on without a receiver.

Julian Consolidated.—The Owens Mine and the Julian Consolidated, including the Helvetia and High Peak claims, at Julian, have been bonded to Eastern men. The mines have been worked off and on for 30 years, but have never been developed to any great depth.

SAN LUIS OBISPO COUNTY.

(*From Our Special Correspondent.*)

Madrone Quicksilver Company.—J. Q. Braun, A. J. Stevens, E. M. Merrifield and other Los Angeles men are opening this quicksilver property, near Cayucos. After constructing a 10-pipe retort the mine has paid its way. The main work is in a tunnel and in open cuts. The ore is said to average over 2 per cent, but some of higher grade is found. A 20-ton furnace will be erected.

SANTA BARBARA COUNTY.

(*From Our Special Correspondent.*)

Lost Mines of the Padres.—Another party, after a long search, has given up the search for these mines, supposed to be somewhere in the Santa Media Mountains. Many years ago rich silver or gold ores were worked at some point in the county, but the place has not been discovered since the State was settled by Americans.

SHASTA COUNTY.

(*From Our Special Correspondent.*)

Bonny View Tract.—On this 500-acre tract, 2 miles below Redding, largely planted in orchard and vineyard, investigations have found gravel beds which it is proposed to work by dredgers. The tract belongs to Balfour, Guthrie & Co., of San Francisco.

Central.—This mine, at Whitehouse, A. A. Anthony superintendent, has been troubled with bad air, but this has been remedied by an upraise from the tunnel. The upraise shows good ore. It is expected that the mine will shortly be sold.

Evening Star.—On this mine, at Whitehouse, owned by Panter & Litcsh, a 1,400-ft. tunnel to tap the ledge is nearly completed.

Mountain Copper Company.—This large copper property at Keswick and Fielding, Lewis T. Wright, manager, in asking a reduction of its tax assessment before the Board of Equalization. It wishes the assessment reduced from $1,325,515 to $735,215, and gives as one of the reasons that the Lost Confidence Mine, the most valuable of the group, has been reduced in value through the extraction of a great quantity of ore. A depreciation in copper prices has lowered profits and fire in the mine entailed large expense.

Saunders Brothers.—William Arps and the McCormick-Saeltzer Company have bonded a group of 5 claims formerly owned by Saunders Brothers in Bully Hill District, south of Winthrop.

Shasta County Resources.—The California State Mining Bureau, L. E. Aubury, State Mineralogist, has issued a register and map of the county giving a complete list of all the mines, their development, location, owners, superintendents, etc. This is the leading county of California as to total mineral product.

SIERRA COUNTY.

(*From Our Special Correspondent.*)

Clipper Ship.—This mine near St. Louis is owned by E. H. Wemple and A. M. Davis, who have applied to the California Debris Commission for a license to mine by hydraulic process and dump the tailings into Cedar Grove Ravine, emptying into Slate Creek.

Doherty.—Geo. W. Cox has asked the permission of the California Debris Commission to work this mine at Howland Flat by hydraulic process and dump the tailings into Slate Creek.

SISKIYOU COUNTY.

(*From Our Special Correspondent.*)

Bloomer.—W. P. Bennett owns 400 acres of gravel in this section and has placed many thousands of dollars' worth of improvements on his claims. He has 5 giants and over 6,000 ft. of hydraulic pipe. Water is brought from Nordhimer Creek to the claims, of which the Bloomer is only one.

Hershey.—O. H. Hershey & Co. have the machinery for a 5-stamp mill at Forks of Salmon and will erect it at once.

Picayune.—At this mine near Forks of Salmon, Stout & Forest are working a No. 1 giant on 80 acres of gravel 12 ft. thick.

Shumway.—At this mine, Forks of Salmon, the owners are making good pay. E. Shumway is superintendent.

SONOMA COUNTY.

(*From Our Special Correspondent.*)

Socrates.—At this quicksilver mine near Santa Rosa the furnaces and machinery have been started. The mine is expected to yield richly.

TRINITY COUNTY.

(*From Our Special Correspondent.*)

Belli.—At Coffee, Wm. Wyrst is building a 10-stamp mill for Mr. Belli.

Headlight.—On this mine near Carrville, F. Fletcher, superintendent, cyanide tanks are being put in. A long tunnel just finished taps the vein at much greater depth than ever worked.

Nash.—This mine at Coffee expects a handsome clean-up from piping the gravel.

TUOLUMNE COUNTY.

(*From Our Special Correspondent.*)

Cosmopolite.—In this mine at Groveland, Harry Argall superintendent, sinking is progressing slowly, owing to hard rock.

Eagle-Shawmut.—At this mine at Chinese Camp, C. E. Uren superintendent, 100 stamps are dropping.

Golden Annie.—J. S. Raggio and D. A. Lumsden have bonded to Felix Chappelet, Jr., this mine, near the Tuolumne River.

Mazeppa Gold Mining Company.—This company at Stent, H. M. Pease superintendent, will shortly erect a 20-stamp mill.

Mount Jefferson.—At this mine, near Groveland, J. M. Meigham is arranging to erect a cyanide plant. There is good ore in the bottom of the shaft.

Shoenberg.—At this mine, near Groveland, sinking is continued, and Mr. Dale will shortly erect a steam hoist.

Stockton Gravel.—On the gravel properties of this company, near Columbia, Wash Tucker superintendent, a $5,000 clean-up has been made. A 300-ft. channel of good gravel is cut.

YUBA COUNTY.

(*From Our Special Correspondent.*)

Daguerre Point Dams.—Members of the United States Debris Commission will shortly begin the construction of the debris dams near Daguerre Point. Contracts will be let in August for several dams.

Pacific Mining Company.—This Chicago company has secured 85 locations running from Challenge Mills, in this county, to Lumpkin, in Butte County. It is now proposed to start developing the properties.

Pennsylvania and Jefferson.—It is probable that work will cease on these mines in August unless additional capital can be secured to continue development. The mines are worked under lease.

Smithurst.—At the claims of George Smithurst, near Browns Valley, good quartz is taken out.

Sweet Vengeance.—This mine, near Brown's Valley, C. C. Mathews superintendent, is worked under bond.

COLORADO.

CLEAR CREEK COUNTY.

Mendota Mill.—This mill, at Georgetown, is practically remodeled, and when finished will have a capacity of 100 tons daily.

Terrible.—This group of claims, at Brownville, is reported transferred to Eastern men, represented by B. C. Catren, who has charge of work. The mine has a good record of production, but has been worked only in a small way by lessees since 1893.

(*From Our Special Correspondent.*)

Consolidated Stanley.—Injunction proceedings have been started to prevent the consolidation of the Stanley and Salisbury properties at Idaho Springs, which are practically owned by one company. Some parties who had tried to sell the mine and at one time found a buyer who did not take it, began suit for commission. They were afraid that the consolidation might prevent them from collecting in case they secured judgment in the proposed suit, and started injunction proceedings in the District Court of Arapahoe County (Denver), but the hearing was transferred to the District Court of Clear Creek. It was to come before Judge DeFrance on July 30.

Kelley Tunnel.—At 725 ft. in this bore, at Georgetown, cut a wide body of ore, rich in both gold and silver, believed to be the Deming lode. A good compressor plant has been installed for driving the tunnel about a mile to the north.

GILPIN COUNTY.

(*From Our Special Correspondent.*)

Mining Deeds and Transfers.—J. Diffenbaugh to G. A. Seeley, 1-5 interest in Two Strangers lode, Union District; C. Trezise to J. W. Baldwin, ⅛ interest Columbine and East Columbine lodes, Pleasant Valley District; T. Haslett to J. K. Stewart, ¼ interest Black Sioux and Wild Sioux lodes, Gregory District; J. H. Kruse et al to Fred Neumeyer, Early Bird and Hill Top placer claims in Kansas District; C. J. Mortensen to the Giant Tunnel Mining and Milling Company, the Gold State and 11 lode claims, situated in Enterprise and Bay State Districts; A. Platt to G. P. Mead, 1-3 interest Little King, Little Fannie and Dexter lodes, Pine District; E. B. Todd to G. P. Mead, 2-5 interest Emma, Little King, Little Fannie and Dexter lodes, Pine District; G. A. Seeley to J. A. Diffenbaugh, 1-5 interest Two Strangers lode, Union District; J. W. Baldwin to A. Ashbaugh, ¼ interest East Columbine and Columbine lodes, Pleasant Valley District.

Blue Grass Mining Company.—Iowa parties, interested in a group of claims in Phoenix District, are installing machinery on the Lone Star shaft. A. Ruffcorn, Rollinsville, is manager.

Clear Creek Reduction and Mining Company.—A steel cable 1 in. thick and 1,500 ft. long has been received for the hoist, and a new 100-h. p. boiler has been installed. Sinking has started, and the lift of 150 ft. will put the shaft down 1,050 ft. Daily shipments average between 50 and 75 tons, all of which are going to the Golden Smelter. The ores carry better values than ever, the production being from $25,000 to $35,000 per month. Berry Brothers, of Detroit, Mich., are the owners, and F. C. Carpenter, Equitable Building, Denver, is manager.

Five O'Clock.—Boulder parties are installing a small plant of machinery on this claim in Central District, and will develop the ground.

Lotus.—Sternberger Brothers are preparing to install a 100-h. p. boiler and a duplex steam pump at the main shaft, and will start development in the lower levels. The owners have a large group of claims, and have been adding to their property for years. J. Woods, Russell Gulch, is in charge.

Newfoundland.—G. W. Mabee, Sr., of Denver, has resumed work at this property, on Gunnell Hill, and as soon as the shaft is pumped out will do considerable work. The mines are credited with a good production in the past.

Town Topics Gold Mining Company.—Some ore showing free gold has been opened on the east 300-ft. level, in the south vein. M. D. Draper, Central City, is manager. The stockholders' meeting has been called for August 5 at 36 Barth Block, Denver.

Victoria.—Stevens & Co. are working this property in Central District, and keep 10 stamps going at the Petersen Mill in Lump Gulch. The ores clean up 2½ oz. gold per cord, and the tailings sell as high as $27 per ton. A trial shipment of a carload to the Golden Smelter gave values of 2.30 oz. gold, 6.8 oz. silver and 5.9 per cent copper to the ton. P. Petersen, Gilpin, is in charge.

Waltham Mining and Development Company.—Idaho Springs and local men are working under a lease and bond of $10,000. They have been making steady shipments to the Idaho Springs mills and recently to the Golden Smelter. The shaft is down only 100 ft. in a big porphyry dike, the vein being opened for a width of over 16 ft. in one place. From net returns of $4.92 per ton the ore values have increased, the last lot giving net returns of $12.88 per ton. The company is figuring on erecting a cyanide plant and mill at Idaho Springs, and is in a position to make heavy shipments. Robert Hastie, Jr., Bald Mountain, is superintendent. The office is at Idaho Springs.

HINSDALE COUNTY.

Auric Mining Company.—This company is to sink a new shaft at least 1,200 ft. at the Ute & Ulay Mine on Henderson Creek, near Park City. The shaft will cut the Ute and the Ulay veins and will be 4½ by 15 ft. in the clear. Contracts have been let. The company is also to build a new mill.

Bon Homme.—The tunnel in this mine at Burrows Park is 1,350 ft.

Hanna Mining Company.—This company has completed the mill and tramway.

Henson Creek Lead Mines.—This company is stoping on its tunnel and has the grading for its mill done.

LAKE COUNTY—LEADVILLE.

(*From Our Special Correspondent.*)

Leadville Ore Output.—The tonnage is about 2,300 tons daily of all classes of material, with a promise of material increase if the smelters can handle the ores.

Leadville Zinc Ores.—The output is 300 tons daily. The A. M. W., Moyer, Yak tunnel and Moyer dump are the principal sources of supply. The concentrates go to Europe, while the crude material goes to Canon City and Eastern mills.

Ballard.—New prospecting work is under way. A large body of low-grade siliceous ore is opened. The dump, a low-grade siliceous ore, running less than ½ oz. gold, is being shipped to the smelter.

Ball Mountain Development Company.—Large

Circular No. 1, series H O, sent out by the Webster, Camp & Lane Company, of Akron, O., is a pamphlet of 16 pages describing the company's geared hoisting engines. These engines are built in several types. The "Sierra" type, having 2 cylinders and 2 drums, is designed for the rapid hoisting of small loads; the "Ibex" type, of heavier design, for high steam pressures, has engine beds of the Tangye pattern with overhung cylinders; the "Compound" type has 2 engines geared to a single shaft and is fitted either with simple or compound engines. The company's standard-geared engine for large mines has an engine connected with 2 drums for independent hoisting, and is adapted for heavy and rapid work. For still heavier work, 2 engines and 4 drums are used. The company's standard hoists can be had either with balanced slide valves, with Meyer cut-off, or with Akron Corliss engines. Hendrie & Bolthoff, of Denver, Colo.; Victor M. Braschi & Bro., of the City of Mexico; the Trent Engineering Company, of Salt Lake, Utah., and Sherriff, Swingley & Company, of Johannesburg, South Africa, are agents for Webster, Camp & Lane engines.

Otto aerial wire-rope tramways are described in a 46-page pamphlet, published by Carl Binder, sole licensee and manufacturer, with offices in the Schiller Building, Chicago, Ill. The pamphlet states that Otto tramways during the past 28 years have been brought to their present high efficiency by the building of more than 1,300 lines in all parts of the world, often under the most unfavorable conditions and to fill the most difficult requirements. The first traction rope of an Otto tramway fitted with Otto friction grips has been in use at Giessen, Germany, for more than 14 years. The advantages claimed for the Otto system are comparatively small cost of construction, independence of topography and atmospheric conditions, ease of loading and unloading, simplicity of operation, and small cost of operation and maintenance. The system, as is well known, uses a stout wire cable for carrying the load and a traction rope. The pamphlet describes in detail the various features of the Otto tramway—such as the traction rope, tension gear, the friction bucket grips, etc. The new Otto grip is said to be in use on more than 100 tramways, and has never failed to work even on grades as high as 45 degrees with single loads of more than one ton. An Otto tramway built for Echeguren, Hermann & Sobrinos, Mazatlan, Mex., 5 miles long, has one span of 3,657 ft., with 7 other long spans, varying from 869 to 2,340 ft. in the clear; another Otto tramway at Cimpy, Siebenburgen, Hungary, is 11¼ miles long, with a difference in level between the terminals of 2,044 ft. It is built in 4 sections, and the operating speed is 400 ft. per minute. The operating expenses, including repairs and maintenance, are 3½c. per mile.

GENERAL MINING NEWS.

ALASKA.

JUNEAU DISTRICT.

Johnson.—The Mines Security Corporation has completed the purchase of these mines, formerly owned by the Nowells, of Boston. President Thomas J. Hurley, accompanied by Prof. N. S. Shaler, of Harvard University, has gone to Alaska to inspect the property.

ARIZONA.

COCHISE COUNTY.

(*From Our Special Correspondent.*)

Calumet & Arizona Mining Company.—This mine, on the 1,050-ft. level, is reported 150 ft. in good copper ore. The company expects to be operating its 250-ton smelter in October.

Calumet & Pittsburg Development Company.—The directors at a meeting in Calumet, Mich., voted to recommend an increase of the capital stock from $200,000 to $400,000, and to issue at once 33 per cent of the increase. This will be used for the purchase of the Del Oro and a bond on the Ormond group of 5 claims close to the property of the company. The Briggs shaft is now down more than 400 ft.

MOHAVE COUNTY.

(*From Our Special Correspondent.*)

American Flag.—This mine, 15 miles east of Kingman, is being unwatered and cleaned out.

Homestake.—This free-milling gold mine, 4 miles west of Kingman, is to have reduction works.

Metallic Accident.—Hank Leften has a lease and bond on this claim, near Mineral Park. The ores carry copper and silver.

Minnesota.—The shaft of this mine, in Wallapai District, is down nearly 600 ft. The 225-ton concentrating plant is idle for want of water, and the best ores are shipped.

Oro Plata.—This mine, in Todd Basin, is again at work. J. W. Gerritt, of Kingman, is the owner and superintendent.

Signal Mill.—The new mill to treat low-grade lead and silver ores erected by Moses Levy, at Signal, has been declared a failure and closed.

Summit.—Gold ore is being shipped from this claim, at Union Pass. Richardson Brothers are the owners and superintendents.

Tintic.—The Philadelphia & Arizona Mining Company will work this old gold mine.

White Hills Company.—This company, at White Hills, proposes sinking a 1,500-ft. shaft on its property.

YAVAPAI COUNTY.

Model Gold Mining Company.—This company is in the hands of a receiver, R. H. Thatcher. The stockholders are mostly Chicago, Ill., men. Allegations of gross dishonesty are made against the directors. The company controlled the McCabe Mine.

CALIFORNIA.

AMADOR COUNTY.

(*From Our Special Correspondent.*)

Bunker Hill.—The north 800 drift on this mine, at Amador City, C. R. Downs superintendent, is in 200 ft. on the ledge, which is 6 ft. wide. No mill will be erected until the ore body on the north 1,800-ft. is developed in the levels below.

Dooley.—This quartz mine, near Ione, still continues to yield good ore.

Edinburgh.—At this mine, near Wieland, David Fisher superintendent, miners are running a tunnel on the vein. Free gold ore has been found.

Ivanhoe.—The hoist and 20-stamp mill at this mine (formerly the Wheeler), near Plymouth, have been destroyed by fire.

Keystone Consolidated.—The new Norwalk compressor at this mine, at Amador City, Charles E. Bunker, superintendent, has closed down, owing to an accident to the electric motor. The compressor operates the hoist and 8 machine drills. The air is reheated by waste and sawdust from the saw mill.

BUTTE COUNTY.

(*From Our Special Correspondent.*)

Gray Elk.—This mine, at Cherokee, formerly the Spring Valley, Alexander Wilson superintendent, is to be reopened at once. The mine was formerly a producer, but has been closed some years.

CALAVERAS COUNTY.

(*From Our Special Correspondent.*)

Duryea.—Sinking continues on this mine, at Central Hill, near Mokelumne Hill, by William and Daniel Nuner. There are 100 tons of milling ore on the dump.

Gold Hill.—On this mine, at Angels, C. Wolff superintendent, preparations are being made to install a hoist and a pump.

Last Chance.—The Salt Lake men who bonded this mine, at Angels, from the George C. Tryon estate are preparing to sink shafts and erect machinery.

Lloyd.—This gravel mine, near Mokelumne Hill, is worked by a Boston company. Superintendent F. F. Ames has 12 men at work.

EL DORADO COUNTY.

(*From Our Special Correspondent.*)

Crystal.—A mill is shortly to be put upon this mine, near Shingle.

Pyramid.—Superintendent Bluett will shortly install an air compressor on this mine, near Shingle.

Vandalia.—The new cyanide plant at this mine, near Shingle Springs, John Rosenfeld's Sons, of San Francisco, owners, is running satisfactorily.

HUMBOLDT COUNTY.

(*From Our Special Correspondent.*)

Little River.—C. W. Hill has begun suit against L. D. Alvord and F. M. Smederer to recover balance due him for his interest in this beach property, near Eureka, sold to them in 1901. He alleges they have since sold the mine to other parties, and have not paid him a balance due.

New Placer Location.—Dennis, Thomas and Celia Tighe have located 160 acres of mining ground near the mouth of Red Cap Creek, near Orleans Bar.

INYO COUNTY.

(*From Our Special Correspondent.*)

Fish Springs District.—At Big Pine G. B. Cometti has opened up a good body of ore. Antone Cunha is working over a tailings pile. The old Mairs Mine, owned by U. Tracy, is being opened by Peterson & Myers.

KERN COUNTY.

(*From Our Special Correspondent.*)

Bright Star.—This mine, long idle owing to litigation, is about to be bonded with 12 other claims, by a Cripple Creek, Colo., company that has a bond on the claim owned by J. B. Ferris. The ore is low grade but plentiful.

Buena Piedra.—At this mine, near Granite Station, 25 miles from Bakersfield, A. W. McCrae superintendent, a strike of high-grade ore is reported.

Yellow Aster Milling and Mining Company.—A mortgage for $100,000 has been placed on this property, at Randsburg, in order to carry out extensive improvements. A large cyanide plant is to be put in, also an extensive pumping plant. This mine is the largest producer in Kern County. It has been paying dividends for some years.

MADERA COUNTY.

(*From Our Special Correspondent.*)

Lingo.—This mine, at Coarse Gold, which has long been idle, has been bonded to T. Clark, of the same place, for Montana men, who will work it. Men are cleaning out the shafts, etc.

MARIPOSA COUNTY.

(*From Our Special Correspondent.*)

Electric Power.—A company has been formed to furnish electric power to the mines of Coulterville and Northern Mariposa County. A dam is to be built on the Merced River, near McCabe's Flat, and work will be begin shortly. The first installation will be for 5,000-h. p.

Guffey Galey Mining Company.—Part of the 6-stamp mill of this company, at Coulterville, is being taken down to prospect other properties recently acquired in another county. The mines are under lease.

Mocking Bird.—William Boldt and W. J. Howard have begun work on this mine, at Guadalupe, about 35 miles from Merced. A recent crushing gave returns of $24 per ton.

NEVADA COUNTY.

(*From Our Special Correspondent.*)

Delhi.—The old chlorination works at this mine, near Nevada City, have been put in order by G. A. Nihell after many years' idleness. New buildings and furnaces have been constructed. There are said to be over 5,000 tons of sulphurets on the dump which will be worked.

Meadow Lake District.—The Crystal Lake Company has rebuilt the mill blown down last winter. Clark & Cook, of the Century Mine, are building a saw mill to get out mill timbers.

Murchie.—This old mine, owned by the Lone Star Mining Company at Nevada City, and for a long time idle, has been started up by J. C. Campbell, who has a bond upon it.

PLACER COUNTY.

(*From Our Special Correspondent.*)

Alameda Gold Mining Company.—At this property, near Westville, in charge of W. D. Pinkston, a 20-stamp mill is being erected.

Bonnie Bee.—At this mine, at Dutch Flat, J. L. Waggoner superintendent, arrangements are being made by H. A. Frost, secretary, to put in a 10-stamp mill.

Central.—This mine, at Towle, formerly known as the Dorer, has started.

Hidden Treasure Mining Company.—In this mine, at Michigan Bluff, H. T. Power manager and C. D. Akers superintendent, miners are developing a new channel encountered some months since at a point 8,800 ft. in. A station has been cut and an electric hoist put in.

Rawhide Gold Mining Company.—At this mine, near Towle, John Patrick superintendent, the new 10-stamp mill is running steadily, and 20 men are employed.

Zelma Bell Gold Mining and Dredging Company.—A contract for a hydraulic elevator on this mine, on the American River, near Colfax, has been let. J. L. Flanagan, of 402 J street, Sacramento, is secretary of the company. A head of 500 ft. of water has been secured and the pipe ordered.

PLUMAS COUNTY.

(*From Our Special Correspondent.*)

Cataract Gold Mining Power Company.—This company, owning the Indian Bar Mine, near Spanish Ranch, has applied to the California Debris Commission for a license to work by hydraulic process and to deposit tailings in the North Fork of Feather River.

Lone Star.—This mine is near Cromberg, and F. G. Low has made an application to the California Debris Commission for a license to work by hydraulic process tailings to be deposited in Jackson Ravine draining into Jackson Creek.

RIVERSIDE COUNTY.

(*From Our Special Correspondent.*)

Santa Rosa.—This mine, at Perris, has started again under Mr. Myers, the new superintendent. Fresh capital has been subscribed and work begun in a systematic manner.

SAN BERNARDINO COUNTY.

(*From Our Special Correspondent.*)

Pacific Coast Borax Company.—The works of this company, at Borate, near Dagget, on the desert, have

bodies of low-grade ore are opened in the old workings, where work has been temporarily suspended. A new shaft is being sunk farther north.

Chrysolite Mining Company.—Lessees are working through the Vulture and Fairview and producing 30 tons of iron daily.

Coronado Leasing Company.—This company holds its lease on the Coronado, and refused to honor the new lease granted to other parties by the Wolcott Mining Company, which own the ground. The new lessees have withdrawn, and the Phoenix Company will most likely develop the Coronado.

Fidelia Mining Company.—This stock concern has gone to pieces, and a portion of its territory has been leased to P. Bohn, who will develop a portion of the Best Friend group.

Fryer Hill Mines Company.—Through the El Paso now handling 1,300 gals. a minute the water is being rapidly lowered. At the Dunkin, Tip Top, Cora Belle and other shafts up is under way preparatory to resuming mining. The railroads will complete spurs this week to all the shafts.

Horseshoe Prince Group.—The vein recently caught holds out developed. The values are high, and indications point to the opening of the Continental Chief ore shoot.

Ibex Mining Company.—The company is shipping 8,000 tons a month, and a large amount of development and prospecting work is kept ahead. The concentration of the power plant reduces costs.

Keystone Mining Company.—Philadelphia people who are backing this proposition on the Rex combination closed down recently on account of financial difficulties. A settlement has been made, and the property will resume shortly.

New Leadville Home Mining Company.—One hundred and seventy-five tons of $5 grade iron ore are shipped daily from the Penrose workings. This ore shows much improvement during the past 30 days.

New Louisville Combination.—Reynolds & Hanifen, who recently purchased the Louisville Mine, have leased and purchased the Colorado No. 2 and Ulster-Newton and adjoining territory, giving 50 acres all told. Work begins through the 825-ft. level in the Louisville. A milling process will be introduced to handle the low-grade zinc sulphides. The territory has been idle for years, and no attempt has been made to handle this low-grade material.

New Valentine Mining Company.—The new stock is being issued at 10c. a share to holders of stock in the old company. The Eastern owners of the ground have also agreed to take large holdings. Arrangements to resume work August 1 are being completed.

President.—Reynolds & Hanifen have begun work under lease, and are shipping low-grade siliceous ore. They are re-timbering the underground workings which have long lain idle, and will later erect a mill.

Printer Boy Gold Mining Company.—The New York owners, represented by W. W. Detrick, are arranging for active work. They announce that the old indebtedness will be paid in full. Prospecting has disclosed some very rich gold ore, but not sufficient work has been done to tell its extent.

Resurrection Mining Company.—Shipments are 75 tons daily. Masses of low-grade sulphides are being blocked out in both shafts. Work on the new concentration mill has started. It will be completed by December 1.

Waswado Mining Company.—This is one of the largest prospecting enterprises on Breece Hill, and is working through the Eclipse shaft now down 1,000 ft. Drifts are being run at 400 and 800 ft. A streak averaging $9 gold is followed in the 400-ft. drift.

SAN JUAN COUNTY.

(*From Our Special Correspondent.*)

Camp Bird Extension.—This property is being developed by contract, the main tunnel being driven to cut the Camp Bird vein about 450 ft. ahead. The tunnel is following a large body of marketable ore.

Eureka Exploration Company.—Several carloads of machinery have arrived for the Silver Wing Mill at Eureka. An aerial tram is to connect the Frederica Mine and the mill.

Gaity Boy.—This group of 4 claims near Silverton has been sold to the International Reduction Company, represented by Charles H. Gage, of Denver, and J. F. Cullen, of Pittsburg, Pa. The stated consideration is $40,000, to be made in payments within a year. A tunnel is in 750 ft. and a drift 350 ft. The vein averages 6 ft. of a good milling ore. A mill is to be erected at once.

Henrietta.—The vein in this Silverton property was cut at 1,400 ft. from the entrance of No. 7 level. It is almost 20 ft. wide and carries yellow and black copper, and copper glance. An average sample is reported to have given 17 per cent copper. A mill may be built at once.

Kendrick-Gelder Smelter.—This plant is in operation again.

Kentucky Giant Group.—Two large bodies of shipping ore were recently cut in the 1,100 ft. tunnel worked by Grebles & Riggs and shipments are regular.

Little Bessie.—This property, recently sold to L. B. McKesson, of Ohio, is now a regular shipper to the local smelter.

Mammoth.—Davis & Downer, of Ouray, are working this property at Mineral Point, and are making regular shipments to the local smelter.

Silver Ledge.—The mill near Silverton is nearing completion and machinery is being installed rapidly. Ten carloads have lately been taken to the ground.

SAN MIGUEL COUNTY.

(*From Our Special Correspondent.*)

Alta Mines Company.—The mill is running steadily, treating from 60 to 70 tons of ore per day, and shipping 6 cars of concentrates per week. A car of high-grade ore is also shipped weekly. A. C. Koch, Telluride, is manager.

Four Metals Mining Company.—The company now controls the Andrus group in Ingram Basin, 3 miles east of Telluride, having bought the remaining 1-3 interest from J. C. Anderson and George P. Betts for $5,500. A long cross-cut tunnel is being driven. The company is building a large dam near the head of the Turkey Creek Basin, 11 miles southwest of Telluride, which is to hold 44,000,000 gals. of water. A mill near the Turkey Creek mines may be built next summer. J. H. Shockley, Telluride, is manager.

Keystone Placer.—The force has been increased and good headway is being made. The new giant is used for piling boulders into a dump daily instead of allowing them to go through the sluice boxes. The practice, although an experiment, is giving satisfaction, and will mean a considerable saving in sluice boxes and riffles. C. M. Coleman is manager.

Lake Hope Tunnel.—This tunnel, being driven by the Telluride Power Company, will drain Lake Hope into Trout Lake. The water will be used to run generators at Ames, which supply the mills near Telluride with electric power.

Nellie.—Men are repairing the 3-4-mile tramway from the mine to the mill below. The tramway is in bad condition from being idle for 3 years, and several towers were wrecked by snowslides last winter. A body of low-grade ore was found in the mine, and as soon as sufficient ground is opened a series of mill tests will be made. Cooper Anderson is manager.

Ophir Consolidated Mining Company.—W. S. Buckley, manager of the Silver Bell and Butler mines at Ophir, has purchased a small experimental cyanide plant used by the Smuggler-Union and will experiment with the tailings from the Silver Bell Mine. The plant will be ready to treat the tailings by August 1.

Slide.—A Milwaukee company is driving a tunnel to cut the Slide, one of the largest veins in the district.

Vanadium Mines.—E. M. Titcomb, manager at Newmire for the United States Vanadium Company, of Chicago, Ill., has men developing claims near Placerville, Fall Creek and Newmire. During the past 4 years he has located for this company 45 claims, each supposed to carry vanadium in commercial quantities. It is expected that ore will be mined and shipped to Paris for treatment this summer.

Wheel of Fortune.—A tunnel is being driven on these claims, on Mount Wilson, to intersect the Wheel of Fortune and other large veins. The tunnel is in 1,800 ft., and will cut the Fortune vein within a few feet.

SUMMIT COUNTY.

Gold Pan.—This placer company, near Breckenridge, has 2 hydraulic elevators and 2 flumes in use. The conveyor for carrying off the tailings is completed. Next spring the company expects to have 5 flumes and 4 elevators busy. The great pit is down 65 ft., about to bed rock.

Robinson Smelter.—This plant, at Kokomo, has been closed to add another furnace.

TELLER COUNTY—CRIPPLE CREEK.

(*From Our Special Correspondent.*)

Brodie Mill.—This mill, at Mound City, is worked under lease by O. B. Finn and associates, who also have a lease on the Ingham dump. The lessees are also doing custom work.

Elkton Consolidated Gold Mining Company.—It is understood that this company will temporarily close the 8th level of the Elkton Mine, and concentrate attention on the upper levels. The reason given is that the present pumping capacity is insufficient to handle the water economically. When new pumps are installed the lower levels will be opened again. The company has had a hard struggle with water for 2 years. E. M. De La Vergne is general manager.

Empire State Consolidated Gold Mining Company.—It is understood that this property, on Bull Hill, adjoining the Isabella, is making steady shipments. The company owns the tailings formerly owned by the Orphan Belle Gold Mining Company. George Kilborn is general manager.

Iron Clad.—A small cyanide plant has been erected to treat the dump, and is understood to have worked successfully. It is reported that the mine has been leased by A. H. Heller, who has a lease on the dump, and that there is a large amount of low-grade ore in the property. Mr. Heller has a lease on the old Arequa Mill.

Londonderry.—An attempt by the owners to get an injunction restraining the United Mines Company from taking out ore from under this property was a failure. The injunction was not granted, because the defendants had not sufficient notice. The arguments will probably be heard again soon. The defendants claim that they have the apex of the vein. Their dispute involves the rich ore being taken out by the Wild Horse Mine, owned by the United Mines Company. The properties are on Bull and Ironclad hills.

Sunshine-Sedan.—As was expected, the trial of this apex case resulted in a hung jury, and the case will have to be tried over again. The result further ties up a good property. The property is on Galena Hill, north of the town of Cameron.

Victor Gold Mining Company.—It is understood that a lease has been granted on the dump. This mine once shipped a large amount of ore, and paid $1,155,000 in dividends, but of late little work has been done except by some leasers in the upper levels. The property lies east of the Isabella, and is owned by David Moffat, of Denver.

GEORGIA.

LUMPKIN COUNTY.

(*From Our Special Correspondent.*)

Dahlonega Gold Mining and Milling Company.—This company has been incorporated, with R. S. Disney as president and S. P. Shope treasurer. The company will work the Briar Patch Mine, near Auraria, and will also operate a dredge-boat on the Chestatee River. The office is in Dahlonega, with a branch office in Chicago, Ill.

Etowah Gold Mining Company.—This company will operate the Betz Mine, near Auraria, Craig R. Arnold being general manager. It is proposed to use a bromo-cyanide process, which is being introduced by the Bullion Recovering Company, of Philadelphia, Pa.

IDAHO.

BLAINE COUNTY.

Mayflower.—At this group 12 men have been working with 2 shifts driving the tunnel. The framing for the mill is done. Alexander Wilson is manager.

CUSTER COUNTY.

White Knob Copper Company.—This company is preparing to resume work at its mines and smelter. George R. Hancock, of Salt Lake, Utah, is to be mine superintendent. The smelter is about ready to go in commission, and the 10-mile electric road between the mines and smelter only needs ballasting to be in good shape. The company will take on men at the mines slowly, and will employ the best class of labor.

IDAHO COUNTY.

Buffalo Hump Mining Company.—The litigation over the Buffalo group is reported settled out of court. The ground was purchased by the company and afterwards jumped by several men who claimed title on re-location.

SHOSHONE COUNTY.

Frisco Consolidated.—D. A. Hyman, of New York City, president of the company, has been at Gem conferring with A. B. Campbell, J. A. Finch, Peter Larsen and other large stockholders. Work may be resumed in a month. When the mine closed down a little over a year ago, owing to the condition of the lead market, it was shipping 1,800 tons monthly and employed 300 men.

ILLINOIS.

SHELBY COUNTY.

Century Coal Company.—This company, recently organized with a capital of $300,000, by Ambrose M. Craddick, of Shelbyville, with principal offices in Chicago, has bought 2,200 acres of fine coal land at Tower Hill, formerly owned by Mr. Craddick, having an 8-ft. vein of bituminous at a depth of 750 ft. Shafts will be sunk and the mines equipped with modern machinery as soon as possible. The officers are W. C. Edwards, president, St. Paul, Minn.; W. O. Wallace, vice-president, Shelbyville; W. R. Edwards, treasurer, St. Paul, Minn.; A. M. Craddick, secretary and assistant treasurer, Shelbyville; A. M. Craddick, W. R. Edwards, D. F. Richardson, Charles E. Hamilton, T. F. Dove and Wallace E. Walker, directors. The company expects to be hoisting coal for the fall trade.

INDIANA.

VIGO COUNTY.

(*From Our Special Correspondent.*)

Slack Work in the Coal Mines.—The 8,000 bitumi-

nous coal miners of this and adjoining counties are feeling the idleness caused by consumers accumulating large supplies of coal previous to the Indianapolis convention. The railroads have more than a month's supply on hand and other large customers are nearly as well supplied. Work will continue light until after the middle of August. On the other hand, the 2,500 block coal miners, who form district No. 8, will be busy throughout the summer as this quality of coal is for domestic use principally and the winter's supply is being mined.

KENTUCKY.

CRITTENDEN COUNTY.

Columbia Mining Company.—This company is to mine the lead and zinc ores on the Columbia property near Crittenden Springs. A shaft is down 160 ft.

Marion Zinc Company.—This company is shipping zinc carbonate ore from the McDowell property near Lola to Mineral Point, Wis.

LOUISIANA.

ACADIA PARISH.

(*From Our Special Correspondent.*)

Guarantee Oil Company.—This company, of Jennings, a new concern with a capital of $500,000, will drill a well about 300 ft. from the gushers.

Jennings' Oil Wells.—Lightning recently struck a 1,200-bbl. settling tank near the gushers, and the fire spread to the derrick of Heywood No. 2 well, the oil and gas coming out of the space between the 10-in. outer casing and the 6-in. pipe being ignited. The flames shot high into the air and the intense heat made it impossible to approach close enough to extinguish the fire by the chemical engine. The other gushers were at once covered with earth and channels dug to carry off the burning oil and prevent more damage to the field. All drilling in the field was suspended and every known method tried to smother the flames, which were finally put out on July 21 by the combined steam pressure of a battery of 12 or 15 boilers.

McFarlain Oil and Pipe Line Company.—This company, capital $250,000, is another new Jennings corporation.

MICHIGAN.

IRON—MARQUETTE RANGE.

Maas.—The drop shaft being sunk at this property near Negaunee is going down slowly. It is now down nearly 140 ft.

IRON—MENOMINEE RANGE.

Dickey Mining Company.—This company has been organized at Marquette with $25,000 capital. The directors are William F. McKnight, of Grand Rapids; Timothy Nester, of Munising; John R. Gordon, and Rush Culver, of Marquette, and John M. Duffy, of Chicago, Ill. The company is to explore the homestead recently acquired of Capt. James S. Dickey, of Iron Mountain. Captain Dickey retains an interest in the property. The homestead is 160 acres of what is called valuable mineral land. It has a frontage on Lake Antoine, and is between the Chapin and Travers mines. The land has never been explored, owing, it is alleged, to trouble over the title.

SAGINAW COUNTY.

Coal Miners Strike.—The coal miners of this and Bay County are still out. The basis of settlement recommended by President Mitchell of the United Mine Workers was rejected by the miners, who have assumed an uncompromising attitude. The strike may last till into the fall. The operators are reported determined to stand by the scale as approved by President Mitchell.

MINNESOTA.

(*From Our Special Correspondent.*)

The Duluth, Missabe & Northern Road has ordered 9 locomotives of 90 tons each, much like the large locomotives of the Duluth & Iron Range road. With these in use the road will be able to increase its loads by about 800 tons.

The new blast furnace of the Zenith Furnace Company, of Duluth, is to be in blast in August. The capacity of the furnace has been increased to about 220 tons daily of coke iron.

Shipments for July are larger than for any month in the history of the district. It is now expected that the Minnesota roads will handle about 13,000,000 gross tons for the year.

The St. Louis County Board of Equalization has fixed the taxable values of mines in the county, Mesabi and Vermilion ranges, at $30,154,905, an increase of about $18,000,000 from the assessment of 2 years ago. The increase was based on a relative scale of values given the board by the mining companies, and is therefore supposed to be reasonably proportional for all properties in the county. About 63 per cent of the St. Louis County mines are properties of subcompanies of the United States Steel Corporation.

MISSOURI.

JASPER COUNTY.

(*From Our Special Correspondent.*)

Joplin Ore Market.—Zinc ore is off $1.50 per ton, but the price of lead ore advanced 50c. per 1,000 lbs. The purchasing agents on Wednesday evening simultaneously offered $2 per ton less than was paid the preceding week. The ore from the Desplains Mine at Carl Junction brought only $1.50 less than in the preceding week, but most of the output brought less. At the close of the week the offers upon the assay basis advanced on a number of lots, but the top price was not affected. The lead ore market was affected by the competition of local and outside smelters. The production is normal and the metal price remains unchanged. The highest price paid for zinc ore during the week was $40.50 per ton, and lead ore brought $24.50 per 1,000 lbs. During the corresponding week of last year zinc ore brought only $28 per ton and lead ore $23.75 per 1,000 lbs. Following is the turn-in by camps of the Joplin District for the week ending July 26:

	Zinc, Lbs.	Lead, Lbs.	Value.
Joplin	2,673,890	442,310	$61,641
Carterville-Webb City	1,052,420	376,200	23,468
Galena-Empire	1,247,810	102,820	22,484
Aurora	920,190	23,240	13,590
Duenweg	.....	62,820	10,493
Carthage	341,310	.....	6,826
Granby	384,000	56,000	6,300
Fortuna	60,390	312,340	8,764
Oronogo	189,410	4,010	3,373
Prosperity	178,960	21,590	3,739
Cave Springs	56,410	4,030	1,058
Central City	96,550	3,900	1,447
Spurgeon	30,830	81,750	2,465
Neck-Alba	187,370	.....	3,560
Carl Junction	581,480	.....	11,326
Zincite	114,700	6,270	2,334
Sarcoxie	48,160	.....	915
Gillan, Ark.	45,600	.....	684
Peoria	.....	19,580	470
Total	8,679,660	1,418,860	$184,937
Total 29 weeks	310,118,790	36,963,280	$5,335,804

Zinc value, week $150,576; lead, $34,361; zinc value 29 weeks, $4,527,729; lead, $808,075.

SAINT FRANCOIS COUNTY.

Mine La Motte Lead and Smelter Company.—This company, a New Jersey corporation, capitalized at $3,000,000 has filed articles of incorporation showing that one third of its capital is to be employed in Missouri, and that the company will have an office at Mine La Motte. Its incorporators are Richard H. Stewart, T. J. Hallowell and George W. Flaacke, of New Jersey. The land acquired embraces 38,000 acres, situated in St. Francois and Madison counties.

MONTANA.

FERGUS COUNTY.

Barnes-King.—Manager King recently took to Lewistown from this mine at Kendall 6 large bricks having a reported aggregate weight of 825 oz. and valued at $16,000. The bricks were from a 17-day run. Work on the addition to the mill to increase the capacity from 110 to 220 tons daily is proceeding fast and will be finished probably before September 1. Foundations for 3 new leaching tanks, 2 solution tanks and 1 sump tank are in place.

Central Montana Mines Company.—This company is to begin working the low-grade ores of the Spotted Horse and Whiskey Gulch mines soon at the mill in Whiskey Gulch. C. T. Durrell is manager.

Montana Verde Company.—Machinery for a stamp mill and concentrating plant is being hauled in from Bernice. The plant is to treat 150 tons of gold ore daily.

FLATHEAD COUNTY.

Snowshoe.—Work on this silver-lead mine at Libby is progressing, and concentrates are being shipped right along. The mine is in the silver-lead district. As soon as the property is open to the 500-ft. level new machinery will be erected and the present force of 80 men increased.

MADISON COUNTY.

Montana & St. Paul Mining Company.—This company recently elected these officers: President, Paris Gibson; vice president, C. M. Webster; treasurer, O. F. Wadsworth; secretary and general manager, W. H. Godfrey; director, George T. Ross. The company owns 14 claims in this county.

MISSOULA COUNTY.

Clark's Fork Gold Mining Company.—The stamp mill, recently erected, is in operation. T. S. Letterman, of Missoula, is manager.

PARK COUNTY.

Bear Gulch.—Several stockholders in this company, at Jardine, have petitioned for the appointment of a receiver to take charge of the company's property. The grounds set forth are alleged misappropriation of the company's funds by watering of the stock. The officers of the Bear Gulch Company have been cited to appear in the district court on August 18, to show cause why the application should not be granted.

The company has placed an order with the Salt Lake Branch of the Allis-Chalmers Company for a 40-stamp mill, complete with bin gates, feeders, high mortars, forged steel shoes and dies, cast steel cams, tappets and stamp heads, copper plates and pulleys, pillow blocks, shafting, etc. Also for a No. 5 style "D" Gates crusher, with manganese heads and concaves.

SILVER BOW COUNTY.

Minnie Healey.—Authority for the Supreme Court under the constitution to issue an injunction in this case has been questioned in a written motion filed with the State Supreme Court by Heinze's attorneys. Thirteen reasons are given in support of the motion. It is alleged that the constitution was misconstrued in the recent decision, and the court has declared itself vested of appellate jurisdiction beyond that conferred by the constitution. The Heinze attorneys also allege that the decision with reference to the power of the district court is erroneous in that it does not apply to the facts as they existed at the time the injunction was granted by the lower court. It is held that the only appeal would have been one for the dissolution of the injunction. There is also objection to the decision on the ground that the judgment of the lower court was not considered.

NEVADA.

LINCOLN COUNTY.

Bamberger's De La Mar Mines.—The stockholders of the April Fool and Boston & De La Mar companies recently ratified the action of the directors in agreeing to sell the properties to the above company.

STOREY COUNTY—COMSTOCK LODE.

Union Consolidated Mining Company.—At the annual meeting, July 22, there were 96,550 shares represented, and the following directors were elected: Chas. H. Fish, John W. Twiggs, A. G. Gurnett, William Bannan and A. F. Coffin. Chas. H. Fish was elected president, John W. Twiggs secretary, A. P. Swain secretary and A. J. McDonell superintendent.

WHITE PINE COUNTY.

Glasgow & Western Exploration Company.—The mill at Cherry Creek is running steadily, with its capacity divided between company ores and the gold-bearing output sent by neighboring mines. Joseph Farren is superintendent.

NEW MEXICO.

LINCOLN COUNTY.

Helen Rae.—This group of mines at Nogal is reported sold.

Old Abe.—This gold mine at White Oaks is reported sold to the Eagle Mining and Milling Company. The mine has the reputation of being the deepest dry mine in the world and is equipped with a 20-stamp mill.

NEW YORK.

ESSEX COUNTY.

Wetherbee, Sherman & Co.—This company is erecting a new separator in Milneville, between the Bonanza shaft and the present separator. The buildings will consist of 4 ore separators, each 60 by 300 ft., and an electric power plant. Arthur McQuillan, of Plattsburg, has the contract.

OHIO.

COLUMBIANA COUNTY.

Westpoint Coal and Coke Company.—This company, capitalized at $200,000, has as stockholders and incorporators East Liverpool, Cleveland and Chicago men. The company will develop the coal territory in Madison Township, near Westpoint. The Westpoint & Northern Railroad, capital $100,000, is to run from Westpoint to Lisbon, thereby giving shipping connections over the Pennsylvania and Erie systems. The contracts for the road have been let.

OREGON.

BAKER COUNTY.

Friday.—It is reported that John Dern and E. H. Aires, of Salt Lake, Utah, have taken an interest in this mine, near Baker City. A mill is to be erected.

LANE COUNTY.

Oregon Securities Company.—This company, organized under the laws of New Jersey with $5,000,000 capital in $1 shares, is organized to take over the interests of the Helena Consolidated Mining and Milling Company, the Musick Mining and Milling Company and the Calapooia Tunnel Company, all in the Bohemia District. The exchange of shares is on this basis: $160 par value of Oregon Securities Company stock for each $100 par value of Helena Consolidated Mining and Milling Company; $100 par value of Oregon Securities Company stock for each $100 par value of Musick Mining and Milling Company; $36.66 par value of Oregon Securities Company stock for each $100 par value of Calapooia Mining and Tunnel Company.

Officials of the Oregon Securities Company state that 85 per cent of the holdings of the smaller com-

panies have been turned over, but this does not mean that these companies will cease to exist, the larger corporation simply acting as a securities company. The Bohemia District mines were described in a recent issue of the ENGINEERING AND MINING JOURNAL. The directors of the Oregon Securities Company are: P. J. Jennings, Portland, Ore.; John W. Wheeler, Orange, Mass.; J. Frank Watson, Portland, Ore.; Albert Hawkins, North Adams, Mass.; A. E. Hull, Hartford, Conn.; Dr. George W. Crosby, Atlantic City, N. J.; L. W. Hoch, Worcester, Mass.; G. B. Hengen, New York City; John H. Pearsons, New York City. The officers are: P. J. Jennings, president; Albert Hawkins, first vice-president; Geo. W. Crosby, second vice-president; G. B. Hengen, secretary and treasurer; John H. Pearsons, assistant secretary and assistant treasurer.

PENNSYLVANIA.

ANTHRACITE COAL.

Coal Miners' Strike.—The many acts of petty violence and intimidation that have increased in number as miners have recognized the hopelessness of remaining idle reached a climax on July 30, when a collision occurred between a riotous crowd of strikers and the city police force at Shenandoah. The miners about Shenandoah are largely Slavs and Lithuanians, a quarrelsome and turbulent lot, and since the strike started Shenandoah has been regarded as the most likely center of a serious outbreak. Deputy Sheriff Bedell, while escorting 2 non-union men from work, was assailed by a mob. The non-union men were put on a Philadelphia & Reading engine and got out of danger. The 20 city policemen who went to Sheriff Bedell's aid were assaulted, and a fight ensued in which 3 men were probably fatally injured and at least 20 men wounded. Thomas Bedell, brother of the Sheriff, was frightfully beaten by the mob, and is not expected to live. This riot had the effect of moving the State authorities, who have refused to call out the militia to repress prior disturbances, and several companies of the militia are now at Shenandoah.

Riotous acts all over the coal-fields have occurred during the week. There is much dissatisfaction among the miners over the distribution of relief funds. The number of men seeking to return to work is steadily increasing, and the strike is evidently nearing a break.

Kohinoor.—This colliery, at Shenandoah, which employed 600 men and boys before the strike, is to be abandoned by the Philadelphia & Reading Coal and Iron Company. Carpenters are razing the breaker.

Wyoming & Pond Creek Coal Company.—This company's property, near White Haven, has been sold by H. L. Beach, receiver, to the C. R. Bachman Coal Company. It is said to be worth about $300,000 and consists of certain anthracite leases and a breaker equipped with machinery.

BITUMINOUS COAL.

A number of Johnstown capitalists have acquired 3,000 acres of coal land known as the Ray tract, in Somerset County, for over $200,000. Horace R. Rose, H. M. Lowman, James N. McKee and Dr. G. E. Conrad are interested. They will incorporate a company with a capital of about $200,000. Work will begin immediately.

Pittsburg Coal Company.—This company has purchased 100 acres of coal under the farm of Mrs. Willard Cook, in Canton Township, for $1,000 per acre. The company has also purchased the coal under the farm of Samuel McClay, adjoining, 100 acres, for $110 per acre. These are the first purchases by the company in that neighborhood.

Sharon Steel Company.—This company has purchased the coal and limestone underlying 51 farms in Platin Grove, Washington and Wilmington townships. The purchase includes an area of about 4,000 acres.

SOUTH DAKOTA.

LAWRENCE COUNTY.

(From Our Special Correspondent.)

Cleopatra Mining Company.—Work is to be resumed at the mine and mill on Squaw Creek. The company is developing the lower ore horizon.

Gold Hill Mining Company.—The shaft is 225 ft. deep. A new pump has been installed. Quartzite should be reached at 300 ft., when drifting will begin. The company's ground is in Spearfish Canyon. Thomas Goodman, of Lead, is superintendent.

Highland Chief Mining Company.—The mining ground and mill, a mile from Deadwood, are under bond to Colorado men. Work has stopped pending the termination of the deal. The cyanide plant has been enlarged to 75 tons capacity.

Horseshoe Mining Company.—A dividend of $70,000 has been declared, payable August 5. The company has a bond on the National Smelting Company's plant at Rapid City. The plant is to be paid for with stock at its par value of $1 per share. The 100-ton cyanide plant at Pluma is being enlarged to 200 tons. Excavations for the new 1,000-ton plant have stopped, and the plant may be built at Rochford, on Little Rapid Creek, Pennington County. The company is buying more ground near Bald Mountain.

Oro Hondo.—Ore has been cut in the shaft. Its width has not been determined.

Penobscot Mining Company.—One hundred and twenty-five men are employed on the new mill and other buildings at Garden City. Most of the machinery has arrived. Work has been suspended at the mines until the mill is completed, about November 1.

Spearfish Mining and Reduction Company.—The machinery at the new cyanide plant has a crushing capacity of 400 tons a day. The tankage is being increased to correspond. The monthly clean-ups are said to run from $23,000 to $30,000.

Sunday.—C. B. Harris is making regular shipments to the Imperial cyanide plant at Deadwood, 5 cars having just been loaded. The ore is said to assay $15 to the ton.

PENNINGTON COUNTY.

(From Our Special Correspondent.)

Black Hills Copper Company.—On the Benedict group the average value of the mill-run is given as $4.65 to the ton. The company purchased the ground last winter and is operating a small Chilean mill.

Spencer & Haines Group.—Herman Bischoff, of Deadwood, representing Colorado parties, has a bond on this ground, comprising 130 acres, next to the Benedict Ground on Castle Creek.

Tycoon Mining Company.—A larger stamp mill is to be erected at Keystone. The 10-stamp mill is running continuously.

TENNESSEE.

KNOX COUNTY.

Roseberry Zinc Company.—This company at Mascot is erecting its 200-ton concentrator and expects to be concentrating ore in 30 days. All of the machinery is on the ground. A number of men are mining ore. W. G. Smith is manager.

TEXAS.

HARDIN COUNTY.

(From Our Special Correspondent.)

Saratoga Oil Field.—Since the pressure has subsided at the Beaumont wells many operators are turning to this field, and 11 wells are under way. The Hooks Company, Byrd Syndicate and W. E. Brice are the most prominent in this development.

Sour Lake Oil Wells.—Sour Lake Springs No. 2 well came in on July 16. It is situated 300 ft. west of the first gushers, seems to be as good, and widens the proven field considerably. Crude oil cannot be bought here for less than 25c. at the well.

JEFFERSON COUNTY.

(From Our Special Correspondent.)

Beaumont Oil Wells.—Very few new wells have been drilled in July, and only 2 or 3 new contracts made. The number of wells finished is 273, of which only a portion are utilized to produce oil. Lack of pumping facilities hampers the field. Crude to fill contracts is not plentiful, and increased consumption holds down the storage and stiffens the price. In every probability crude will be worth 50c., f. o. b. Gladys, inside of 60 days.

The only drilling well attracting any attention is the Smith well No. 3, of the Denver-Beaumont Company, which is in oil sand at 1,400 ft. It is 200 ft. further east than the company's No. 2, which is at present the most easterly well on Spindletop.

The following new companies have been chartered: Gladys City Oil and Power Company, Beaumont, capital, $25,000; Gum Carbo Company, of Beaumont, $1,000,000; Eclipse Power Company, of Beaumont, $10,000, and the Texas Co-operative Oil Company, of Beaumont, capital, $25,000.

UTAH.

(From Our Special Correspondent.)

Ore and Bullion Settlements.—For the week ending July 26 the banks report the following ore and bullion settlements: Bullion, $134,800; gold bars, $145,200; gold, silver, lead and copper ores, $126,200.

BEAVER COUNTY.

(From Our Special Correspondent.)

Annie Laurie.—The preliminary examination by E. L. Whitmore, of Montana, for a syndicate is completed. The price said to be asked for the property is $5,000,000.

Midas.—The mill has closed for the time being owing to tue lack of water. Superintendent J. W. Chandler has taken to Salt Lake auro-cyanides valued at over $2,000, from a 2 weeks' run.

IRON COUNTY.

(From Our Special Correspondent.)

Dear-Lerch.—P. L. Kimberly and Frank Buhl, of Sharon, Pa., have just bought for nearly $1,000,000 these iron ore properties. The properties were taken up from the Government 4 years ago by Mr. R. B. Dear, of Duluth, Minn., associated with Lerch Brothers, chemists, of that city, and were secured for the price of vacant Government land. That iron ore existed thereon had been known for a long time, but no attention had been given by those knowing it. Considerable development has been done on the properties, and they will be explored thoroughly by the new owners. A first payment has been made through Walker Brothers, of Salt Lake.

JUAB COUNTY.

(From Our Special Correspondent.)

Tintic Shipments.—During the week ending July 26 the output was as follows: Geminii, 11 cars ore; Mammoth, 6 cars ore; May Day, 3 cars concentrates; Grand Central, 2 cars ore; South Swansea, 7 cars ore; Eagle and Blue Bell, 3 cars ore; Carisa, 4 cars ore; Bullion-Beck, 2 cars ore.

Orient Mining Company.—W. M. Nesbitt, of Eureka, has made an examination of this ground. He states it is purely a cyaniding proposition.

SALT LAKE COUNTY.

(From Our Special Correspondent.)

Alta Shipments.—The Columbia Mine has sent to the smelters at Salt Lake 1 car ore; the City Rock, 1 car, and the Regulator, 1 car, for the week ending the 26th of July.

Bingham Shipments.—During the week ending July 26 the Storey Mine has sent 1 car to the samplers and the Highland Boy Smelters has sent east 3 cars of copper bullion aggregating 180,000 lbs. The Bingham Copper and Gold Smelter shipped east 120,000 lbs. of copper bullion.

SUMMIT COUNTY.

Daly West.—The coroner's inquest into the death of John Borgie, the powder man, who was at the magazine on the 1,200-ft. level when it exploded, resulted in a verdict condemning the storage of explosives underground and urging the passage of a law prohibiting the practice. The jury was unable to determine the cause of the explosion. The damage to the 1,200-ft. level is about made good and the mine is working as usual.

(From Our Special Correspondent.)

Park City Shipments.—During the week closing July 26 shipments were smaller compared with usual weekly lots because of the disaster in the Daly-West recently. Shipments were: Daly West, 2,595,050 lbs. ore; Silver King lease, 120,000 lbs.; Silver King, 1,245,987 lbs.; Daly-Judge, 209,450 lbs.; Ontario, 457,700 lbs.

Daly-Judge.—It is stated that plans are completed for enlarging the concentrating mill to handle 300 tons daily.

Daly West.—Manager J. E. Bamberger has returned to the city. The directors are to make provision for the families of the victims of the recent explosion.

Minola Mining Company.—This company is capitalized at $500,000, in $1 shares. The directors and officers are as follows: A. H. Mayne, president; F. M. Wilson, vice president; A. M. Spooner, secretary; S. C. Park, treasurer; John T. Hopkins and Hiram E. Booth, directors. The claims of the company are at Park City and have been under development by Mr. Mayne for some time.

TOOELE COUNTY.

(From Our Special Correspondent.)

Stockton Shipments.—For the week ending July 26 the Ophir-Hill shipped 33 cars concentrates, the Hidden Treasure 1 car of ore, and the Brown 1 car.

Ensign.—This property has begun active work on the tunnel in Pine Canon. It is estimated that 400 ft. more will connect with the main shaft.

Utah.—It is stated that this company will continue its main shaft 100 ft. below water level.

WASHINGTON.

FERRY COUNTY.

(From Our Special Correspondent.)

With the railroads nearly completed into Republic and the assurance of cheap transportation to distant smelters, mining companies are putting their mines in shape and beginning to stope ore. New wagon roads are being constructed to the adjacent camps. It is now settled that the Republic Mine will be reopened.

California.—Timbers are being cut and framed for the shaft. The working force is 45 men. Stoping continues on the 1st and 2d, and has been started on the 3d level. Since the new wagon road was finished 15 carloads of ore have been shipped to the smelters. The mine is now producing about 50 tons per day.

Lone Pine-Surprise.—Stoping is the only work now in hand. Charles P. Robbins, the president of the company, has arrived from Spokane. The working force has been increased to 7 men.

Peacemaker and Eureka Fraction.—Machinery has been ordered, and a shaft will be sunk 500 ft., more

or less, to strike the south extension of the Quilp vein on its dip.

Republic Consolidated Gold Mining Company.—J. Bresnahan, one of the new directors, now superintendent of the mine, has returned to Republic, and will take charge of the property. The ore in the old stopes will be mined and new ground opened.

Sheridan Camp.—A new wagon road is under construction to the Zala M. Mine, 12 miles in all from Republic and 13 miles shorter than the old road. On account of difficult transportation the camp has been nearly idle the past year. The Zala M. Mine has been opened by shaft, winze and tunnel to a depth of 300 ft., and has shipped some high-grade ore to the smelters. The only active work at present is on the Pasco group, the north extension of the Zala M. The ores carry principal values in silver, but occasionally run well in gold, with a little lead and more or less copper. The vein stone of the camp is mostly hard crystalline quartz, differing greatly from that of Republic. The Phil Sheridan is opened by a shaft to 75 ft., and has shipped ore averaging $101 per ton by the smelter returns, including $11 gold and 2 per cent copper.

Silver Dollar.—The machinery for sinking has arrived, and is being installed.

Trade Dollar.—The ledge has been cross-cut on the 300-ft. level, and drifts are being run on it.

OKANOGAN COUNTY.

(*From Our Special Correspondent.*)

Bodie.—This mine has been opened by surface cuts, shafts and 3 tunnels, the lower of which is in 408 ft. At 325-ft. cut the vein is 18 ft. wide at a depth of 407 ft. The values run from $4 to $8, principally in gold. A shaft sunk 60 ft. from surface showed quartz 8 ft. wide, averaging $20 per ton. An open cut shows a rich streak 30 in. wide that has given single assays as high as $4,900 per ton, of which $225 was in gold and the balance silver. The gross value of 65 tons shipped from the open cut and shaft to the Greenwood Smelter was $2,530. The wagon freight was $5 and treatment charge $5 per ton. The ore carries about 92 per cent silica, 2 per cent iron and 2 per cent lime. The Bodie Mine is just over the west line of Ferry County, the line running through Sheridan camp. Between Sheridan and Bodie is Torado camp. The three camps are included in one district, named Vanderbilt. Bodie veins were for 3 or 4 years held in very low estimation. The Bodie Mine is owned by the Bodie Mining Company, of Spokane, Wash. The present work consists of drifting on the pay shoot in the No. 2 tunnel, where 6 men are employed on 2 shifts under Superintendent James Cronan.

Elk.—This claim is east of and parallels the Bodie. An assay across the west vein, 4 ft. wide, from the bottom of a 12-ft. shaft on the Nellie King, ran $12.50 per ton—$3 in gold and the balance in silver. A tunnel is in 150 ft. The east vein was cut 90 ft. in and cross-cut 8 ft., with values running for 4 ft. $34 and 3 ft. $23 per ton, nearly all in gold. An average sample from 18 in. of the west vein assayed $95 in gold and 5 oz. silver per ton. In a winze 20 ft. below the tunnel level and intervening prophyry disappears, and the bulk of quartz assays $9 per ton.

Maud West.—This claim joins the Bodie on the west, and shows a vein cropping. A tunnel, in 50 ft., cross-cuts this vein 6 ft. wide at a depth of 40 ft., the quartz assaying from $2 to $4.50 per ton. A lower tunnel being driven is in 165 ft., and is expected to strike the vein at a depth of 225 ft.

WEST VIRGINIA.

Miners' Strike.—The strike continues to peter out slowly. In the Pocahontas about 75 per cent of the men employed before the strike is now at work. The agitators and turbulent men were dispersed at the beginning of the strike; the more conservative who left for their homes in Virginia and North Carolina are slowly returning. The Pocahontas Collieries Company offers these wages: For pick mining and loading entry coal, 90c. per car; for pick mining and loading room coal, 75c. per car; for mining and loading machine under-cut entry coal, 70c. per car; for mining and loading machine under-cut room coal, 58c. per car; inside track layers, $2.00 to $2.25 per day; inside track layer helpers, $1.50 to $1.75 per day; inside timber men, $2.00 per day; inside timber men helpers, $1.00 per day.

In the Fairmount Region comparatively few men went out, and at present more miners are busy than at any previous time in the history of the district. The July production is very large. The miners in the New River and Kanawha fields have been induced to hold out by activity of labor agitators, but a number of these have been arrested for violating injunctions of Federal judges, and the strike is not likely to last much longer.

HARRISON COUNTY.

Chieftain Coal Company.—This company, composed largely of men in Fayette and Westmoreland counties, Pa., has been organized, with E. A. Humphries, of Scottdale, as president, and Harry Dunn, of Connellsville, secretary. The company owns 2,500 acres of coal near Clarksburg.

MONONGALIA COUNTY.

New York and Pittsburg men have purchased a large tract of coal land, the Freeport vein, on Booths Creek, 4 miles south of Morgantown. They will open mines and build 400 coke ovens. A track 2 miles long will be built from the mines to the Fairmont, Morgantown & Pittsburg Railroad at Uffington.

WYOMING.

CARBON COUNTY.

North American Copper Company.—This company has acquired the Ferris-Haggerty Mine, according to a local paper, and the company now owns the Ferris-Haggarty Mine, the Kurtz-Chatterton Mine and several lesser properties; the Boston-Wyoming Smelter, the aerial tramway, the property of the Grand Encampment townsite, the Frambach water works and an electric light franchise.

FOREIGN MINING NEWS.

AFRICA.

RHODESIA.

The report of the Rhodesian Chamber of Mines for the month of May shows 10 mines at work, 8 being in Matabeleland and 2 in Mashonaland. The total number of stamps in use was 195. The total ore crushed was 25,204 tons, and 16,504 tons of tailings were treated in 5 cyanide plants. The yield of bullion was: From mills, 14,936 oz.; tailings, 3,427 oz.; placer and miscellaneous, 1,235 oz.; total, 19,598 oz. crude, equal by values to 16,210 oz. fine gold, or $335,056.

AUSTRALIA.

NEW SOUTH WALES.

Broken Hill Proprietary Company.—This company's statement for the 4 weeks ending July 16 shows a total output from the refinery of 372,766 oz. fine silver, 4,403 tons lead and 39 tons hard (antimonial) lead.

QUEENSLAND.

Mount Morgan Gold Mining Company.—This company reports for the month of June a total of 20,928 tons of ore treated by chlorination. The yield was 12,211 oz. gold, an average of 0.58 oz. per ton.

CANADA.

BRITISH COLUMBIA—CARIBOO DISTRICT.

Cariboo Gold Fields.—This company, near Barkerville, is working steadily, and the elevator does good work with very little lost time.

China Creek Hydraulic Company.—This company is working the China Creek claim, B. A. Lassell being manager. A single giant is moving 2,000 yds. of gravel daily.

National Hydraulic Mining Company.—This company, at Beaver River, on the Quesnel, near Ashcroft, has installed its plant, and is now actively mining. There are 5.3 miles of ditch and flume and 2,000 ft. of pipe line. The pipe is from 22 in. to 9 in. in diameter. This ditch has a capacity of 2,000 miner's inches, much more water than will be used with the present line of pipe. It is the intention to run several ground sluices as well. The pipe used was manufactured by the Vancouver Engineering Works of Vancouver. G. L. Betts is the company's engineer.

Slough Creek.—At this company's mine, near Barkerville, the drift is being pushed ahead since the channel was tapped in the upraise. Mr. Hopp is superintendent. Everything about the mine is in good order.

Thistle.—This placer mine, at 8-Mile Lake, has 11 men working and J. Ross foreman.

BRITISH COLUMBIA—CASSIAR DISTRICT.

Atlin Mining Company.—This company has bought the City of London dredging lease, the Pennant, Blue Peter, Montreal, Quebec, Vancouver, Victoria and Omega hydraulic creek and bench lease claims. The consideration is £7,500, payable in 3 equal installments of £2,500 each, the first payment to be made November 1, 1902. The water record, granted last October, and the hydraulic plant on the ground were also included.

BRITISH COLUMBIA—EAST KOOTENAY DISTRICT.

Crow's Nest Pass Coal Company.—Most of the company's miners at Fernie are still on strike. The company has made several attempts to get men from Pennsylvania, chiefly Italians and Hungarians, but by the efforts of the strikers many of these have been kept from going to work. The company is pushing the construction of its coke ovens at Morrissey and Michel. The strike at Fernie was caused by a schedule of working hours ordered by the new superintendent, Mr. Tonkin, and has been on since June 25. A sympathetic strike ordered by the miners' union at Michel on June 30 lasted but a week. Owing to work at Fernie being suspended the smelters in the Boundary District have suffered from a lack of coke.

Sullivan Smelter.—This plant, under erection at Marysville, to treat the silver-lead ore of the Sullivan Mine at Kimberly, is reported to have suffered from bad management, and there are rumors that much of the work done will have to be remodeled. It is not thought that the plant will be in operation this year.

BRITISH COLUMBIA—ROSSLAND DISTRICT.

Rossland Ore Output.—The Rossland mines have been more fortunate than those of the Boundary in respect to their supplies of fuel, says the Rossland *Miner*. While the tie-up at Fernie led to the temporary closing of the Phoenix and Greenwood mines the Rossland mines were scarcely hindered. When the supply of Fernie coal dropped off the Le Roi commenced burning wood at its boiler plant. The Center Star and War Eagle employed Roslyn coal, and the Le Roi No. 2 continued to use electrical power as before. It is expected that after August 1 the shipments from the Le Roi dump will be substantially increased.

The output of ore for the week ending July 19 and for the year to date is as follows:

Le Roi	5,100	129,336
Le Roi No. 2	1,500	37,107
Center Star	....	4,310
War Eagle	....	420
Rossland Great Western	....	2,400
Giant	130	750
Cascade	....	300
Columbia-Kootenay	....	30
Bonanza	....	90
Velvet	....	250
Spitzee	....	20
Total	6,730	179,376

Theodore H. Schweitzer, of Rossland, has secured a contract to supply the Canadian Smelting Works at Trail with the lime rock for fluxing in the smelter. The rock will be mined at the Northport quarries, from which the supply for the Northport Smelter is now taken.

NEW BRUNSWICK—WESTMORELAND COUNTY.

Intercolonial Copper Company.—At the company's mine, between Sackville and Dorchester, 25 miners are busy getting out ore carrying from 2½ to 3 per cent copper. The company recently bought out the Westmoreland Mining Company, whose property adjoins that of the Intercolonial Company, so that it now holds under an 80-years' lease 3 square miles of land.

NOVA SCOTIA—CAPE BRETON.

Dominion Iron and Steel Company.—It is stated that this company has bought the deposit of magnetic iron ore at Whycocomagh, on which considerable exploration work has been done during the past year. The price paid for the property is said to be $100,000. The ore is reported to run 60 per cent iron, with phosphorus below the bessemer limit.

NOVA SCOTIA—HALIFAX COUNTY.

Mackay Mill.—During May, June and July 48 tons of quartz crushed at this mill at Molega yielded 119 oz. gold. One of the crushings consisted of 4 tons and 600 lbs. from George King's property at North Brookfield, which gave 40 oz. and 5 tons from A. McMullen's gave 12 oz.

Brookfield.—This company's mill during May, June and July crushed 2,138 tons which yielded 930½ oz. gold.

ONTARIO—ALGOMA DISTRICT.

Consolidated Lake Superior Company.—This company recently closed the purchase of a claim adjoining its Helena Mine upon which the iron ore deposit extended. Included in the purchase are several other iron ore claims in the immediate vicinity of the Helen Mine, and the company has also acquired from the same owners the balance of the water front property at Michipicoten Harbor, where the terminals and ore shipping docks of the Algoma Central Railroad are located. The railroad to the Josephine Mine, 12 miles beyond the Helen Mine, has been completed and the Josephine Mine is being developed by a shaft now down 40 ft.

(*From Our Special Correspondent.*)

There is now great activity in mining circles at Sault Ste. Marie. Many parties of prospectors are hunting for minerals of economic value. In the Mississaga District finds of copper have been reported of late, and one reported by a prospector named Ripley is said to equal the Rock Lake Mine, and is 12 miles east of that mine. It is expected that development work on this property will be pushed.

Frances.—The Algoma Commercial Company, Limited, has a gang of men at work testing this iron property by means of a diamond drill.

Grace.—At this gold mine there are now 1,000 ft. of underground workings, and work is being pushed. A 10-stamp mill is being erected, and is expected to be in operation this fall. The mill machinery is furnished by the Allis-Chalmers, of Chicago, Ill.

Helen.—During the present season nearly 200,000 tons of iron ore have been shipped from this iron

mine by way of Michipicoten Harber to lower lake ports. About 200 men are employed.

Manxman.—Twenty men are at work on this property, owned by the Manxman Gold Mining Company, sinking shafts, etc. The main shaft is down 135 ft. The vein is said to carry good values, and plans for the erection of a stamp mill are under way.

Mariposa.—In the Michipicoten District 10 claims owned by a small syndicate, headed by A. B. Blackinton, have been sold to a company in Sault Ste. Marie, Mich., for $60,000. A gang of men is at work completing the necessary work before Crown patents can be issued.

YUKON TERRITORY.

During June quartz claims recorded at Dawson numbered 92. Renewals numbered 70, the greater number of which represent considerable work. The quartz properties are on the creeks and hillsides, such as Bonanza, Eldorado, Gold Run and Hunker creeks, others on the Indian River slope, and some on the hills overlooking Dawson. The total number of sales were more than 1,300. Among the groups of placer properties transferred were 50 claims, sold first by B. K. Balking and S. A. James to J. A. Williams, and then sold in turn by Mr. Williams to Colonel William Oliphant. The Forty-nine group, on the left limit of Bonanza, has been sold by the Ginzburgs to J. A. Williams, manager of the Dawson Electric Light and Power Company. The Munger Mill Company, which has a stamp mill on a branch of Gold Run, will, it is said, put in machinery to work the rock on Gold Run.

Morley Ogilvie, son of ex-Gov. William Ogilvie, has been preparing to install a big dredge on the Stewart River for a concession company, for which he is mining engineer. The dredge is being put together at White Horse, and will be floated down the Yukon. It is 25 by 80 ft., and will have a capacity of 1,000 yds. every 24 hours. A company already has piping on Excelsior Creek, above Dawson, for a hydraulic plant.

North American Trading & Transportation Company.—This company is working a coal mine in the Forty Mile District, 10 miles below Forty Mile. The main shaft is down over 165 ft. Tests made of the coal show it to be lignite of good steam-producing qualities. The vein is 9 ft. thick.

SOUTH AMERICA.

BRITISH GUIANA.

The Mines Department reports the production of gold for the month of June, on which royalty was paid, at 10,134 oz., against 6,616 oz. in June, 1901, an increase of 3,518 oz. this year.

Diamonds.—Exports of diamonds for the half-year ending June 30 were 6,144 carats, valued at $64,230, against 728 carats, valued at $10,464 in the first half of 1901. For the first half of this year the Armeny, Fogel & Leggatt Syndicate reports the finding of 54,740 stones, having a total weight of 4,129 carats. The British Guiana Diamond Syndicate reports 9,371 stones, weighing 923 carats.

Kaolin.—Exports of kaolin for the 6 months ending June 30 were 900 tons.

MEXICO.

SONORA.

(*From Our Special Correspondent.*)

Cananea Consolidated.—The mill which H. W. Hardinge is constructing for this copper company of La Cananea is nearing completion. It is a 500-ton affair, strictly up to date, Mr. Hardinge considering it better to apply new features as the ore requirements demand rather than as inventors of machinery insist.

MINING STOCKS.

(Complete quotations will be found on pages 171 and 172.)

New York. July 31.

Speculation has been largely attracted to railroad stocks, and mining shares have been rather neglected. The exception has been Amalgamated Copper, in which dealings have been fair, the stock rising at one time to $68 and closing at $67¼.

In the outside market British Columbia Copper brought $8½; Greene Consolidated, $28; Montreal & Boston, $2½; Tennessee Copper, $17½@$17¾; Union, $3¾; White Knob, $19½. The transactions were not large.

The Colorado stocks were quiet and rather weak. Isabella sold at 27c., and Mollie Gibson was quoted at 9½c. There were small sales of Ontario, of Utah, at $8.50@$8.75.

The Comstocks were dull and neglected. The only sales reported were of Consolidated California & Virginia, at $1.30, and Mexican, at 52c.

Boston. July 30.

(*From Our Special Correspondent.*)

With but few exceptions mining shares show slight changes for the week. There seems to be a general solidifying of the market, and it is easy to bid up stocks without bringing out many offerings. At times there is aggressive buying, but it is soon over, and the market again flattens out, although prices hold fairly well. Many bullish circulars have been issued, all based on the belief that the mental situation is becoming simplified, and that the large interests will sooner or later reach an agreement; the source of these is not doubtful, and this deprives them of all importance.

Copper Range Consolidated follows Amalgamated in market movements, and is very easily marked up. It touched $60.25 to-day, which is up $1.75 from a week ago. Lawson figures in this stock, which seems to have a strong pool behind it. Mohawk is another active stock when there is any activity, although it fluctuates within narrow limits. It has advanced $1 this week to $45.50. But little has been done in Heinze's United Copper, yet the price is firm, close to $35. Utah Consolidated stiffened to $22, Centennial to $20.75, Bingham to $35, Tamarack to $180 and Wolverine to $60. Some of these reacted fractionally, but such setbacks were unimportant.

The movement of Dominion Iron and Steel attracted attention, the stock jumping up $9 per share to $67.50, with the close to-night $66.87½. The buying is generally credited to the Canadians, and has been very heavy. President Ross says that the company could sell three times the present output, which is 10,000 tons of steel per month. The cost has been reduced about ½ since the plant started last February. Net earnings of the Dominion Coal Company for March, April, May and June were $300,000 ahead of the same time last year.

Cochiti Gold Mining, which has been dormant for many months, started up Tuesday, and rose from 50c. to $1.25 on the announcement that Messrs. Coram, White and others had purchased a gold mine in the Guanajuato District, in Mexico, and intended buying the Cochiti's mill and transporting it to the Mexican mine. Cochiti stockholders are expected to get a small equity in the transaction.

Calumet & Hecla directors declared a $5 dividend this week, calling for $500,000, payable August 26 to stock of record July 30. This makes a total distribution of $79,350,000 by this mine.

United States Coal and Oil has been steadily absorbed, although the price has held close to $17.50.

Colorado Springs. July 25.

(*From Our Special Correspondent.*)

The local market showed some improvement this week, especially in the mines list. This has manifested itself not so much in an appreciation of values as in the demand for good mines. That is to say, there have developed several good deals for leading Cripple Creek mines during the past week, and while the negotiations have not proceeded far enough to announce the details, they indicate that there are several purchasers of mines yet to be reckoned on. The Last Dollar is one that is being negotiated for. These shares in consequence jumped from 65 bid on July 19 to $1 asked to-day. The latter quotation is the one at which the deal is said to be negotiated. A second deal for $750,000 was closed on July 18, and a first payment of $100,000 made. No announcement of the property involved has so far been given to the public. Isabella and Vindicator have been involved in the general report of mines sold, but nothing authentic can be learned. But all of this talk, some of which is well founded, has had a tendency to infuse new life into the mines list on the local market. This has been the leading feature of the week.

Readers of the JOURNAL have had no occasion to complain regarding the repeated breaks in Elkton, as the condition of this mine has been portrayed each week in advance of what the market has done. This week the new executive committee met and decided to close down the 8th level for an indefinite period awaiting a time when some co-operative plan of pumping the Cripple Creek basin could be arrived at. In the meantime the management will take out all the ore in the 7th level—admittedly not much—after which the future ore yielding power of the property will depend on what additional exploratory work can be done in the 9th level off from the now famous water course. The shares advanced under professional backing from 32c. on July 19 to 37¼c. July 21, and fell back to 32⅛c. on the 23d. The market is being sustained, it is reliably reported, in the expectation of catching a coterie of brokers who are short.

El Paso has been maintained at about 50c. all the week. Last Dollar ranged from 60c. to $1 this week, due to the sale which it is reported is being negotiated. Isabella advanced from 23¾ to 27c. during the week, owing to some improvements in the mine of which the public has not been informed. Vindicator was strong from 90c. to $1 during the week, although the last days of the week failed to bring up any quotations. Portland was quoted at $1.61@$1.70 a week ago, but advanced to $1.75@$1.90, closing at $1.70@$1.90, with but little stock changing hands.

Salt Lake. July 26.

(*From Our Special Correspondent.*)

Although the weather has been somewhat hot, the volume of business on the Exchange was about the same as in the week preceding. Features of the week have been the Daly-West, Daly-Judge, California and Century. Prices have in several cases advanced many points, and in very few cases have the prices of last week fallen below those prevailing at the close or at the opening.

Of the Tintic stocks, 10,200 shares of Carisa sold at 29¼@26¾c., which is a few points ahead of last week. Grand Central has advanced from $4.60 to $5, but only 2,500 shares came out at that price. May Day sold 17,700 shares at 21@19⅜c. There was nothing doing in Uncle Sam this week excepting 1,000 shares at 26@26½c.

Of the Park City mines Daly-West stood steady at $52@$51, with sales of 1,425 shares. Daly-Judge has made some remarkable jumps in the last two weeks, having gone from $8.50 to $12 per share; sales were 4,995 shares.

Mercur properties are holding strong, with the Mercur Consolidated steady at $2@$2.06, these prices bringing out but 5,480 shares. Sunshine is selling around 20@20½c., but is not active. The Exchange closes with total sales of 121,050 shares for the week.

San Francisco. July 26.

(*From Our Special Correspondent.*)

The market was fairly steady at the opening, but trading was light and some weakness in prices developed later. Business has now apparently settled down into dulness for the summer.

Some quotations noted are: Ophir, $1.30@$1.35; Consolidated California & Virginia, $1.30; Mexican, 54@57c.; Sierra Nevada, 20c.; Best & Belcher, 19c.; Justice, 13c.; Chollar, 9@10c.; Savage, 4c.

On the Oil Exchange trading was slow, but there was some improvement over the preceding week. Home sold at $3.05; Twenty-eight, $1.35; Sovereign, $1.25; Junction, 17c.; Oil City, 12c.; Lion, 4c. Sovereign and Lion were the favorites.

London. July 19.

(*From Our Special Correspondent.*)

The London mining market still nominally exists, but there is an entire absence of speculation of any sort. The public has lost touch with mining speculation, and there is nothing in the market at present that is at all attractive. It is very little good offering anything new to the public, and promoters are at their wits' end to know what to do.

The only new mine of any note that has been acquired by Englishmen recently is the Camp Bird, of Colorado. On account of the state of the market the shares are not being advertised at all, and no prospectus has been issued. The shares were mostly allotted to the guarantors, but there is no difficulty in buying them at about par. As the information as to capital issued and terms of purchase has not been widely disseminated, there are no great inquiries for the shares.

The directors of the Parral Mines, in the State of Chihuahua, Mexico, Los Salices District, have acquired mines in the same district and have floated them under the names of the Diaz Mines, Limited, and Beckman Mines, Limited. The Parral mines were originally floated 10 years ago, and they were not successful; but in 1900 Mr. Hawdon, who has put several Mexican properties on their legs, acquired the mines and reconstructed the company. So far success has not yet attended his efforts, as there is some metallurgical difficulty which is not as yet explained. The new mines, Diaz and Beckman, are similar properties and promise well. I believe the trouble with the extracting plant is not serious, and that in the course of time all three properties should work at a profit.

Another old Mexican property that has turned out well under Mr. Hawdon's direction is the Mesquital mines, situated in Zacatecas. For many years the English company floundered in the mire of overcapitalization and heavy debenture debt. Three years ago the property was acquired by Mr. Hawdon for the proverbial old song, and with the low capitalization of £25,000 and an economical management it has under his auspices paid dividends amounting in all to 41 2-3 per cent. The directors now recommend a cyanide plant for treating the tailings, and for the purpose of providing the necessary capital £5,000 worth of shares are to be issued at 100 per cent premium. A good deal of money has been spent also in remodelling the stamp mills on modern lines, so that the company may now be said to be in an excellent condition.

COAL TRADE REVIEW.

New York. August 2.

ANTHRACITE.

The howling mob that overpowered the Sheriff at Shenandoah and the long lists of assaults and outrageous acts of various kinds that have occurred with increasing frequency during the past 10 days are sure

indications that the strike is becoming very unpopular, and the professional agitators who feel their prestige waning are resorting to desperate methods to keep the men out. It is possible also that there are some of the labor officials who want to have the strike last long enough to enable them to handle the relief funds a few weeks. The "expenses" of relief distribution are, judging from previous strikes, considerable and not to be neglected. At the same time there is a widely circulated rumor that some of the strikers, feeling that the strike is hopelessly lost, and realizing that certain men have needlessly caused them to loose nearly 3 months' wages, are determined to stay out, to claim relief funds, and, if the promised liberal aid is not forthcoming, do what they can to wreck the organization. The operators meantime maintain their position unchanged, saying that the demands of the Union really meant the surrender of all discipline at the mines, that they do not care to precipitate rioting and bloodshed by aggressive measures, and that the mines will resume as soon as the men are ready to go to work. The clean-cut and vigorous statement of President Fowler, of the New York, Ontario & Western, is opportune, and should have a little effect on those newspapers that have been printing crazy stuff to the effect that the operators are prolonging the strike with the deliberate intention of advancing prices, and have already made millions of dollars out of vast amounts hoarded at the beginning of the strike.

The total tonnage mined in May has been officially estimated at 1,708,892 tons. No figures of the June or July output have been published, but the output was almost wholly washery coal, the principal exception being the product of the semi-anthracite mines at Bernice, the owners of which, by winning a long strike last year, are now running with non-union men, and no doubt getting a nice profit on the output. The total shipments of all mines to June 1 are given as 18,731,879 tons, as against 22,727,056 tons to the corresponding date in 1901.

Trade in all consuming territories is light, and supplies are getting low. At the head of the lakes the docks are bare of certain sizes, and the total amounts on hand are little over 25,000 tons. In Chicago territory there is little doing. Dealers are not seeking trade, and those consumers who would like to lay in winter supplies receive no encouragement. Stocks are diminishing, and little coal is available for out-of-town shipments. Along the lower lakes and in Canadian territory coal is scarce. At Montreal prices are $6.50 per ton, the highest price for July for many years, and dealers will not sell for forward delivery. Along the Atlantic seaboard supplies are getting pretty low, and dealers are doling out coal in small lots and to regular buyers. Retail dealers at Philadelphia are asking $7 for egg, stove and chestnut and $5 for pea. At Boston retail prices have been advanced $1 to $8 per ton. At New York Harbor points prices vary. Retail dealers in Brooklyn are asking $7, the regular price in Manhattan is $8, but often $9, and in some cases $10 is asked. The total stocks in the retail yards of Greater New York are undoubtedly low. The regular wholesale prices for August are: Broken, $4.15; egg, stove and chestnut, $4.40 f. o. b. New York Harbor shipping ports. Only in a few cases have the companies any coal to sell, and that is in limited amounts for certain old customers who must have anthracite.

BITUMINOUS.

The Atlantic seaboard soft coal trade shows few changes from last week. Speculative prices are $3.05 @$3.25 f. o. b. New York Harbor shipping ports, and a considerable quantity of coal can be had at these figures. The market, if anything, is a trifle stiffer, due to the slow transportation from mines to tidewater that has prevailed during the whole week. The time taken for coal to come through is 3 or 4 days longer than the prevailing time of 2 weeks ago.

The strikers in the bituminous fields are slowly returning to work, but many of them at the beginning of the strike scattered to their homes, hundreds of miles from the mines, and getting information to them is slow work, as their present whereabouts is often unknown. There is some discontent among the miners at not receiving any relief from the action of the Indianapolis convention, as they feel they should have a share of the large strike funds that have been so freely advertised. This feeling will probably widen the breech between the anthracite and the bituminous miners.

It is understood that considerable coal from the Pittsburg District is in the seaboard markets, in spite of a freight rate of $1.80 per ton, attracted by the high prices that have prevailed.

Trade in the far East is calling for all the coal covered by contracts that it can secure, but the speculative market in this territory seems to have fallen off. Along Long Island Sound consumers are taking all the contract coal they can get, and the speculative market is a little more active. At New York Harbor ports consumers depending on contracts or on speculative coal are pretty well cared for.

Transportation from the mines to tidewater is slow, and coal is coming through unevenly. Car supply at the mines is extremely variable, ranging from 80 per cent up. In the coastwise vessel market vessels are in large supply, and rates are weak. Charters are so scarce that many vessels are returning Eastward light, and if this continues rates will advance. We quote current coastwise freight rates from Philadelphia as follows: Providence, New Bedford and Long Island Sound, 50@55c.; Boston and Salem, 60@65c.; Wareham and Portland, 70c.; Portsmouth, 65@70c.; Bangor, 70@75c. and towages; Lynn, 75@80c.; Bath, 70@75c.; Saco, 85c. and towages; rates from the lower ports are 5@10c. higher than above.

Birmingham July 28.

(*From Our Special Correspondent.*)

The differences yet existing between miners and mine operators at several of the smaller places in Alabama are being rapidly eradicated. To-day 700 men at Belle Ellen, in Bibb County, resumed work in the mines there, and within the next 2 or 3 days it is expected that the usual output of 2,500 tons daily will be reached. The mines at Montevallo, Gurnee, Piper and one or two other small places, employing about 600 men in all, are still idle. At the Piper mines, in Bibb County, the United Mine Workers of America, Alabama District organization, have ordered the members not to return to work until 10 men who were discharged are reinstated. Two of the mines at Blocton are in operation now, and while the production there is to be cut short some, it is believed that employment will be given to a greater number than was anticipated some time since. All the mines in Jefferson County are in full operation again.

Considerable development is going on in the coalfields in Blount County, just adjoining Jefferson. The Louisville & Nashville Railroad is constructing several spur tracks and small lines. There is more or less trafficking going on in Alabama in coal lands, and indications point to a number of good purchases being made for development in the near future.

The demand for coke is greater than the production, and as a consequence a good price is brought for the product. There is still much coke being brought into the State from other fields.

Chicago. July 29.

(*From Our Special Correspondent.*)

Dealers whose speculative tendencies caused them to load up too heavily with bituminous stocks, prior to the Indianapolis convention, are bewailing the necessity of unloading at a sacrifice now. The end of the glut will not come for two weeks, to all appearances. Meanwhile prices are largely fictitious. Sales depend not so much on what is asked as what can be got. The overstock is mostly in Illinois and Indiana coals.

Prices for August 1 will advance slightly on West Virginia coal, which will be $3.22, and on Pittsburg, which will be $3.30. Hocking is slated to be lower on city deliveries, and higher on country, the new prices being $3 for city and $3.20 for country. Youghiogheny was advanced 10c., being now quoted at $3.30. Other prices are about the same as last week: Smokeless Pocahontas, $3.50 for lump and egg, $3.25 for nut and $3.10 for run-of-mine; Indiana block $2.55 (selling very well); Indiana semi-block, $2.10; Clinton lump (but little sale), $1.90; Indiana lump, $1.85; Northern and Central Illinois run-of-mine, $1.80@$2; Southern Illinois, run-of-mine, $2@$2.20; blacksmith's coal (in good demand), $3.35.

Anthracite is now hardly to be had, but its absence causes no uneasiness to dealers or the public. Smokeless coals continue in especially good demand, as a result of the strike.

Cleveland. July 29.

(*From Our Special Correspondent.*)

A very serious situation is facing shippers of coal by the lake routes. The months of July and August ought to be the best season of the year for the shipment of coal. During those months the boats are not seriously engaged in the grain trade, and can devote themselves to both coal and ore. The coal shippers, instead of making a big record during July, are showing up on the wrong side. All of them have been getting less coal than they actually need, and some few have made the report that their shipments during the week that just closed were but 50 per cent of their requirements. This is beginning to look very much like either an enormous fall movement or perhaps a shortage of coal next winter at the upper lake ports. The latter is more probable. It will be impossible now for the hard coal shippers to send up the lakes enough to catch up; while it appears equally impossible for the coal shippers to make up in the remaining months what they have lost during those which have preceded and yet keep up with the regular spot requirements. The condition of the railroads leading to the lakes seems to make this especially pertinent. The change in the method of car charges has given the railroads here all the cars they need, but even with these on the sidings there are not enough locomotives to haul the trains after they have been made up. The coal shipment during the past week has been light, as reported above, and in addition boats have been very abundant at all of the loading ports, and all of them have been delayed. The situation is not very inviting.

Pittsbuurg. July 30.

(*From Our Special Correspondent.*)

Coal.—The rivers remained navigable during the week, and the Monongahela River Consolidated Coal and Coke Company was able to ship about 6,000,000 bush. of coal to Southern ports. Most of it went to Cincinnati. All the mines are running steadily, but for a day or two there was a scarcity of railroad cars, which retarded shipments somewhat. The miners are not paying the assessment of $1 a week for the benefit of the striking anthracite miners as readily as was at first anticipated, and it now seems probable that less than $10,000 will be sent from this district each week. The river coal combine plans to ship 3,000,000 tons of coal by rail next season, and is arranging to erect rail tipples at a number of its mines. The rail shipments during the past year or two have not exceeded 1,000,000 tons, and this year's output was bought by Frank M. Osborne, former president of the Pittsburg Coal Company, now at the head of the Youghiogheny & Ohio Coal Company. This concern has entered the lake trade, and will be a formidable rival of the Pittsburg Coal Company next season.

Connellsville Coke.—While the tonnage was slightly increased the shipments fell off a little. There seems to be enough railroad cars, but there is not sufficient motive power, and as a result some of the furnaces in the Valleys suffered to a certain extent. Furnace coke is still quoted at $2.25@$2.50, but premiums of $1 and $1.50 are readily obtained for prompt shipment. The *Courier* in its last issue gives the production for the week at 249,599 tons, a slight increase. The shipments for the week aggregated 12,062 cars distributed as follows: To Pittsburg and river tipples, 3,919 cars; to points west of Pittsburg, 5,699 cars; to points east of Connellsville, 2,444 cars. This was a decrease of 80 cars compared with the shipments of the previous week.

San Francisco. July 26.

(*Special Report of J. W. Harrison.*)

Since the steamer *Sonoma* left, there have been the following arrivals of coal from Newcastle, N. S. W.: *Hecla*, 2,186 tons; *Hugomont*, 3,932 tons; *Europa*, 3,001 tons; *Lord Cairns*, 2,018 tons; *Port Caledonia*, 3,780 tons; *Osborne*, 4,773 tons; *Melanope*, 2,236 tons; *Auldgirth*, 2,522 tons; total, 24,448 tons. This is the largest amount of coal which has been delivered here from the Colonies this year, between steamers, and makes a large decrease in the number of vessels now loading at Australian ports. When the last steamer left, there was reported on the engaged list sufficient tonnage to carry 94,000 tons to this port. There are now but 23 vessels, with a carrying capacity of about 62,000 tons, hence we may look from this time forward for a monthly shrinkage of coal carriers. It would appear that bedrock prices for Colonial coals had been reached, as there appears, for the moment, to be a better feeling prevailing. No marked improvement can be looked for, as the prices obtainable for steam production are regulated by the value procurable for fuel oil, which is exceedingly low. It is evident that importers of Colonial grades will make endeavors to increase their sales for household purposes, and they probably will to an extent be successful, unless our Coast domestic coals shall be further reduced in price.

Prices.—Our special correspondent reports prices for Coast coals to dealers as follows: Wellington and Southfield, $8; Roslyn, $7; Seattle and Bryant, $6.50; Coos Bay, $5.50; White Ash, $5. For Rocky Mountain coals, large lots, quotations are: Castle Gate, Clear Creek, Rock Springs or Sunnyside, $8; Colorado anthracite, $14. For Eastern and foreign coals, cargo lots, prices are: Pennsylvania anthracite, $14; Cumberland, $12; Welsh anthracite, $13; cannel, $11; Brymbo, $7.50; Wallsend, $7.

Foreign Coal Trade. July 31.

Export trade here continues very quiet. The usual trade is being done to the West Indies and to South American ports. To European ports business has been checked by the speculative prices prevailing on coal at seaboard ports.

Ocean freights continue low, but no special charters are noted this week.

The French Consul at Bale, referring to the report that it was intended to introduce American coal into Switzerland by securing of wharves at Havre and Rouen, and preferential railway rates to the interior, expresses his doubts as to the success of the enterprise, if indeed contemplated. He believes that the present position of the German, British and French coal trades will render the importation of American coal impracticable. Moreover, the increasing use of water-power in Switzerland is also a factor to be considered. From investigations he has made, he says it is certain that at the present moment no American mine is in negotiation with any coal merchant in Bale.

Messrs. Hull, Blyth & Co., of London and Cardiff, report under date of July 19 that the general tone of the Welsh coal market remains extremely quiet, and prices are easy for all descriptions of coal. Quotations are: Best Welsh steam coal, $3.90@$3.96; seconds, $3.78; thirds, $3.54; dry coals, $3.48; best Monmouthshire, $3.36@$3.42; seconds, $3.12; best small steam coal, $2.04; seconds, $1.92; other sorts, $1.74.

The above prices for Cardiff coals are all f. o. b. Cardiff, Penarth or Barry, while those for Monmouthshire descriptions are f. o. b. Newport, exclusive of wharfage, but inclusive of export duty, and are for cash in 30 days, less 2½ per cent. discount.

The freight market is very quiet, and rates remain at a low level in all directions. Some rates noted from Cardiff are: Marseilles, $1.30; Genoa, $1.32; Naples, $1.32; Singapore, $3; Las Palmas, $1.50; St. Vincent, $1.74; Rio de Janeiro, $2.94; Santos, $3.12; Buenos Aires, $3.24.

IRON TRADE REVIEW.

New York. July 31.

The feature of the market this week has been found in heavy transactions for pig iron for 1903 delivery. These cover both foundry grades and bessemer pig. Some delay in current deliveries, especially of foundry iron, is still caused by fuel difficulties.

Foreign material continues to come in, and the billet situation is much easier. The National Wire Company, of New Haven, Conn., has contracted for 11,000 tons of foreign steel billets, the order being divided between the Dominion Steel Company and a German firm.

In finished material the trade is easier, except in structural material, for which the demand is still pressing.

The full returns of pig iron production for the first half of 1902 will be found on another page.

Birmingham. July 28.

(From Our Special Correspondent.)

The agreement entered into by the larger iron manufacturers in the Southern field, fixing the prices of iron at $17 and $18 per ton, until June 30, 1903, will be adhered to strictly by those interested, but a better price is already being received for their iron by those companies which are not in agreement. The market at present is almost an unprecedented one. There is not much spot iron, and whatever can be obtained is bringing the very best prices. For instance, it is stated that small lots of No. 1 and 2 foundry iron have been sold for immediate delivery for $20 and $22 per ton. J. W. McQueen, secretary-treasurer of the Sloss-Sheffield Steel and Iron Company, predicts that spot iron will bring $25 before January.

The local consumption is heavy, and the manufacturers have not been able to furnish all of it. Recently the United States Cast Iron Pipe and Foundry Company had to purchase for its pipe works in Bessemer 2,500 tons of gray forge iron, and also to ship some iron down from Sheffield.

The production in Alabama is once more in its normal state. The Sloss-Sheffield Steel and Iron Company during the past week blew in its No. 2 city furnace, and it is now making 200 tons of iron daily. The furnace was thoroughly repaired, and its capacity increased. Furnace No. 3, at North Birmingham, belonging to the same company, is being relined and otherwise repaired, and will not be ready before September 1. At present the Sloss Company has 6 furnaces in blast, 2 in Birmingham, 1 one at North Birmingham, 2 at Sheffield and 1 at Florence. With the exception of coke, there is an abundance of raw material in this district for the furnaces, and the labor question at the furnaces and mills is also being bettered right along.

Pig iron quotations are firm and inclined to improve. The following is the published list: No. 1 foundry, $17@$18; No. 2 foundry, $17; No. 3 foundry, $16@$16.50; No. 4 foundry, $15@$15.50; gray forge, $14.50@$15; No. 1 soft, $17@$18; No. 2 soft, $17.

Buffalo. July 29.

(Special Report of Rogers, Brown & Co.)

The local situation is characterized by a well defined buying movement for next year's delivery, notwithstanding the fact that this season of the year is generally a stagnant period in the pig iron market. Some buyers, however, still feel that there is no hurry in covering so early for their 1903 supply, and have a presentiment that prices will remain about stationary at least until the fall; others plainly show their anxiety to get under cover as quickly as possible. For what little iron is still available for delivery during the balance of this year the premium prices asked and paid continuee to advance. We quote below on the cash basis f. o. b. cars Buffalo. These figures are for early shipment iron; the prices which are being quoted for next year's delivery are on a considerably lower basis: No. 1 strong foundry coke iron, Lake Superior ore, $25.75; No. 2, $25.25; Southern soft No. 1, $23.50@$24.50; No. 2, $23@$24.

Chicago. July 29.

(From Our Special Correspondent.)

Sales of both Northern and Southern pig iron continue brisk, though in somewhat smaller orders than last week. Prices for Northern have advanced somewhat, No. 2 being quoted to-day at $23, with No. 1 50c. higher and No. 3 50c. or less lower. Southern is near the Northern mark; sales are said to range between $22 and $23 for small lots in 1902, with the probability that on the larger contracts for next year most sales are being made at $21.15@$21.65, Chicago, or $17.50@$18, Birmingham. More than ordinarily Southern real prices are doubtful, however. The sales of Southern are said to have been much larger, proportionally, than those of Northern in the last week.

Coke is scarce and higher in price; Connellsville brings $5.50 easily; West Virginia is at $5.50@$6.

Cleveland. July 29.

(From Our Special Correspondent.)

Iron Ore.—Another shortage of cars with which to move the ore from the docks to the furnace stock piles has come to hamper the movement of that material down the lakes. The shippers, however, have not eased up on chartering at the head of the lakes, and have continued to take all of the boats that have presented themselves. The excessive movement down the lakes and the slow movement of the material from the boats to the furnaces has caused vessels to congest at the unloading ports, causing serious delays to shipping. This has been the only feature of a market otherwise tame. Rates of carriage remain at 75c. from the head of the lakes, 65c. from Marquette and 55c. from Escanaba. Very little talk is heard of ore sales, but the prices hold firm at $4.25 for bessemer old range, $3.25 for non-bessemer old range and bessemer Mesabi, and $2.75 for non-bessemer Mesabi.

Pig Iron.—Foundry producers are now able to get any price they ask for spot shipment, and some sales have been heard of as high as $25. Very little iron is showing up even at that price. Most of the activity is in sales for next year's delivery. All of the iron for the first quarter has been sold, and most of the production for the second quarter has been disposed of, the buying during the last two weeks being very heavy. Some few firms have bought on into the third quarter, and a few instances are learned where one or two consumers have covered their entire needs for next year. On these sales the prices run about $21@$21.50 for No. 2 Valley furnace. Basic is selling at $20 for 1903 delivery, and is going in large lots with spot sales of off basic being made at $20.50 at the furnace. Bessemer is about off the market for this year, with no quotations as yet on second quarter delivery for 1903.

Finished Material.—Some of those who have bought structural material for 1903 delivery have specified on their contracts already, and the tendency is becoming quite general. Adding to this there is a continual specification on contracts for this year ahead of requirements, showing something of the stability of the market at this time. The structural sales have now taken in about all of the material for the first half of next year, and some contracts are going over into the third quarter. The future prices hold firm at 1.60c. Pittsburg, while spot prices do not change from 2½c. Plate sales for 1903 delivery continue to be heavy, and all of the material for first quarter delivery is said to have been sold. The demand for plates for immediate delivery is also still very large, and those who have them are commanding large premiums. Most of the quotations now are 2c. at mill. An order for ship material of 1,000 tons, including plates and shapes, was taken this week. An order also was given here for 1,000 tons of agricultural material, mostly bars and plates. The bar steel trade seems to be picking up, while the bar iron trade is decreasing, and there is a report that some bar iron producers have been bidding under the market quotation of 1.80c. to get business. Bar steel prices remain at 1.60c. Pittsburg for bessemer and 1.70c., Pittsburg, for open-hearth. Rails are still active, but it is evident that most of the business for next year has been done. Light rails are still commanding $38@$40. The sheet trade is brisk, despite the frequent reports of smaller concerns bidding under the market price, which does not seem to have been materially affected. The prices are 2.50c. for No. 10 and 3.50c. for No. 27 as a basis.

Philadelphia. July 31.

(From Our Special Correspondent.)

Pig Iron.—A change has come over the crude iron market which is attributed to the expectation or the promise of considerable supplies of pig iron from unexpected home sources and from foreign sources. Contracts have been placed abroad for Cleveland and Middlesboro iron for delivery here for several thousand tons, but the actual figures are withheld. The fact that iron can be had from abroad at fair prices has done more to give confidence and tone to this market than anything else. Buyers are over their fright, or, at least, do not show the same anxiety they did two or three weeks ago. Several concerns who were about placing large orders at home have received assurances which have resulted in their practical withdrawal from the market for the present. At the same time quotations have not been reduced. Quotations are not altogether reliable, but are given by some makers and brokers at $24@$24.50 for No. 1 foundry; $22@$22.50 for No. 2; $22 for No. 2 plain; $21 for standard forge; $20.50 for basic; $23 for low phosphorus. Middlesboro iron is quoted at $21.50, and Scotch iron at $22.50@$23.50.

Billets.—The situation in regard to billets cannot be determined by information received from local sources. The only thing we go by is reports from Western Pennsylvania. Nominal quotations for foreign bessemer are given at $30, but it is believed that a lower figure will be named very soon. Basic open-hearth is quoted at $33 to $35. Early deliveries are rather difficult to obtain. The feeling, however, is that the market has turned the corner, and those who can afford to wait will profit by a little delay.

Merchant Bar.—Bars are scarce for prompt delivery, and it is almost impossible to obtain them. Merchants bars are quoted at 2@2.20c., and have been sold within a day or so at the latter figure. Refined iron is at 2c., for city delivery, and business has been done as high as 2:10, but it was exceptional.

Sheet Iron.—The market is dull, very little doing; but quotations continue at 2.30c. for No. 10; 3.40c., for No. 28.

Skelp Iron.—Skelp iron is very strong, although the Eastern manufacturers are not able to show any orders.

Merchant Steel.—Merchant steel is strong, although a minimum of business has been done. Consumers in this territory and throughout the New England States are reported as not very well supplied with stock. Prices have not been shaded.

Tubes.—The tube market is very strong, and a good deal of business in small lots has been done for the earliest possible delivery.

Plates.—The plate business continues in excellent shape. As much business has been rejected within the past ten days as accepted. Some of this since has gone West. All mills are as full of business as they care to be. Small lots are selling at a premium. Universals are 2.10@2.15c., in small lots, although in a large way it is said that 2c. is the outside price. Flange averages 2.15c., although 2.25c. was paid this week. Fire-box, 2.30c., and marine, 2.35c.

Structural Material.—A good deal of business contracted for 2 or 3 weeks ago and longer has not yet reached the mills, owing to the absence of parties who were to submit the specifications. Negotiations are still pending for foreign supplies.

Steel Rails.—Some additional orders have been sent to the mills within the past few days.

Old Iron Rails.—Not to be had at any price, but quoted nominally at $25; old steel rails, at $21.

Scrap.—Arrivals of foreign scrap have had the effect of quieting quotations. A good deal of foreign stuff has been purchased and deliveries are now awaited. Steel scrap is strong at $21, although $22 was paid for two or three small lots. Country scrap is quoted at $20. Machinery cast, $18@$19; low phosphorus scrap, $29@$29.50; cast borings, $11, and wrought turnings, $17.

Pittsburg. July 30.

(From Our Special Correspondent.)

The iron and steel markets are dull, which is usually the case at this season of the year; but great activity is expected in the fall. In pig iron the number of inquiries and business done show an improvement over the existing conditions a year ago. Consumers are short of pig iron, particularly for steel-making purposes, and the inquiry is very good for the balance of the year. For foundry iron this year the demand is not so good. No. 2 continues to be sold for 1903 delivery, and prices are a trifle firmer. It is claimed that $22, Valley furnaces, for bessemer for the fourth quarter has been obtained. There is no question but that the market is quite strong. Most of the iron, and there is very little of it, is in the hands of middlemen, the furnaces being almost entirely sold up for this year. No sales of bessemer or gray forge for shipment during the last half are noted. An important deal has just been closed by the leading bar iron producer, but the details are not made public. It has contracted for a supply of bessemer pig iron of 7,500 tons a month for the entire coming year, the purchase aggregating 90,000 tons. It was an exchange deal, and the price is not given. The United States Steel Corporation has not made any arrangement for its requirements of pig iron for the second quarter, the price asked by the merchant furnacemen being $20.50, Valley furnaces, or $4 a ton more than was paid for

150,000 tons for delivery during the first quarter. It is estimated that the Valley furnacemen will close the year with fully 25 per cent of their contracts undelivered, which will crowd next year's business. A sale of 1,000 tons of Virginia basic is noted this week at $19 at the furnace, which is higher than the sales made a few weeks ago, indicating that the market is stronger.

Steel continues scarce, and high prices have been paid for urgent requirements. Foreign steel has proved to be a disappointment. The quality is not satisfactory, and shipments on some large lots ordered have been delayed. The weights of sheet bars are not accurate, and buyers are countermanding orders where it is possible. In some instances buyers are trying to dispose of their foreign purchases at a loss, and it is safe to say there will be no further buying of foreign steel for this district. Plates are more active than any other finished line, and premiums paid for early delivery are greater than a week ago. The structural mills are filled for this year, and some are behind in deliveries. As a result a large tonnage contracted for will not be shipped until next year. Orders are being booked for 1903, and the indications point to an unusually heavy business.

The sentiment in favor of accepting the proposition of the American Tin Plate Company by the tin-plate workers of the Amalgamated Association, which calls for a reduction of 25 per cent on 1,500,000 boxes of tin-plate for export trade has changed. From present indications the offer will be rejected when all the lodges have voted. The officers of the association are attending all meetings of lodges when the matter is considered and urging the men to vote in favor of the proposition. While the reduction seems large it is only on the business that now goes to Wales, and in the aggregate means but 3½ per cent cut from the present scale rates on all tin-plate produced. It is argued that by accepting the proposition the tonnage will be increased 16½ per cent, and while the workers will receive about 3½ per cent less than the scale calls for, their earnings will be increased fully 12½ per cent on account of the additional employment that will be given. The amount of tin-plate imported last year by the Standard Oil Company and the Swift and Armour packing interests for export on which a rebate of 99 per cent of the duty was allowed reached 1,270,000 boxes. It is estimated that fully 1,500,000 boxes will be required this year. The lodges whose members are employed at the small plants, and who do not get steady employment, favor the plan, while it is opposed by the workers in the large plants who are almost constantly employed.

Pig Iron.—The inquiry for pig iron is very good for the rest of the year, but no sales of any consequence are noted. Bessemer is quoted at $21.25@$21.50, Valley furnaces, for the fourth quarter. No price is named for prompt shipment. Gray forge is strong at $21, Pittsburg, for any delivery, but no sales of importance are recorded. Foundry No. 2 is quoted at $23, Pittsburg, for this year, and $21.75@$22 for 1903. Sales were not particularly heavy this week.

Steel.—A few odd sales of bessemer steel billets were made at high prices, but most of the consumers are unable to pay the prices asked. Sales this week of a few hundred tons were made at $34.25 for August delivery. Offers of $32 for large quantities have been made, but there were no sales at that price. Plates are active, and prices are firm at 1.60c. for late delivery, 1.85c. for two months and 2@2.25c. for spot shipment. Steel bars are quiet. A few small lots sold at the base price of 1.60c.

Sheets.—The demand is fair for this season of the year, but there are too many mills, and prices are kept down. Corrugated sheets are quoted at $2 a square for No. 28 gauge, a cut of 10c. within the past two weeks. Black sheets, No. 28 gauge, remain at 3c. in large lots. Galvanized sheets are now 75 per cent off, which is equivalent to 4.25 for No. 28 gauge.

Ferro-manganese.—There were no sales of domestic 80 per cent, and the English product is still quoted at $53 and German at $52.

New York. August 1.

Pig Iron.—Iron for delivery before 1903 commands handsome premiums; in fact, there is practically no spot iron to be had. An increasing tonnage is being placed for 1903 delivery at prices on a par for those demanded on forward delivery for some time past. The New York market feels the quieting effect of importations of Scotch and Middlesboro iron more than the market at point inland. We quote Northern irons tidewater delivery: No. 1X, foundry, $23@$25; No. 2X, $21@$22; No. 2 plain, $22@$24. For Southern iron on dock, New York, No. 1 foundry, $22.75@$23.25; No. 2 $21.75@$22.25; No. 3, $21.25@$21.75. Foreign irons are selling for $22@$25 ex-ship.

Cast Iron Pipes.—Eastern foundries are unable to take orders offered on account of lack of iron. For 6 and 9-in. pipe $34.50 per gross ton at New York is asked.

Bar Iron and Steel.—The market continues strong. We quote on large lots on dock: Refined bars, 1.95@2.05c.; common, 1.85@1.95c.; soft steel bars, 2@2.05c.

Plates.—Demand is still heavy. We quote for tidewater delivery in car-loads: Tank, ¼-in. and heavier, 2.05@2.35c.; flange, 2.15@2.40c.; marine, 2.25@2.60c.; universal, 2.05@2.25c.

Steel Rails.—Standard sections are quoted at $28 f. o. b. mills for 1903 delivery; light rails $30@$35, according to weight.

Structural Material.—Large contracts are closed right along, and the market is firm. We quote for forward delivery on large lots at tidewater as follows: Beams and channels, 2@2.30c.; tees, 2@2.25c.; angles, 2@2.25c.

Cartagena, Spain.

(*Special Report of Barrington & Holt.*)

Iron and Manganiferous Ores.—Shipments since last report have been one cargo, 2,150 tons dry ore, to Glasgow; making a total of 171,455 tons to date. The position of the market remains unchanged, and the demand for all classes of ore continues good. Calasparra magnetic ore is in good demand, and a few odd cargoes are reported having been made for August-September shipment.

Quotations for iron ores are per ton, f. o. b. shipping port: Ordinary 50 per cent ore 6s. 6d.@6s. 9d.; special low phosphorus, 7s.@7s. 6d.; special iron ore, 50 per cent iron, 3 per cent manganese, 6 per cent silicon, 8s. 6d.; specular ore, 58 per cent iron, 9s.; magnetic ore, 60 per cent iron, 5 per cent silicon, 11s. 6d. for lumps, 9s. 6d. for smalls. For manganiferous ores quotations are: No. 1, 20 per cent iron and 20 per cent manganese, 14s. 3d.; No. 1 B, 25 iron and 17 manganese, 11s. 3d.; No. 2, 30 iron and 15 manganese, 10s. 3d.; No. 3, 35 iron and 12 manganese, 9s. 6d. All grades of manganiferous ores are rated at 11 per cent silicon and under 0.03 phosphorus.

Iron Pyrites—Quotations for iron pyrites, 40 per cent iron and 43 per cent sulphur, are 11s. per ton, f. o. b. shipping port.

CHEMICALS AND MINERALS.

New York. July 31.

Heavy Chemicals.—The market continues quiet and prices show little change from last week's quotations. Domestic chemicals, we quote, per 100 lbs., f. o. b. works, as follows: High-test alkali, in bags, 77½@82½c. for prompt shipment, and 75@77½c. for forward; caustic soda, high-test, $1.90@$1.95 for early delivery, and $1.85@$1.87½ for futures; bicarb. soda, ordinary, 95c., and extra, $3; sal soda, 65c.; chlorate of potash crystals, $8.50, and powdered, $8.75; bleaching powder, off-test, $1.35; best grades mostly under contract. For foreign goods we quote per 100 lbs. in New York: Alkali, high-test, 90@92½c.; caustic soda, high-test, $2.25; sal soda, 67½@70c.; chlorate of potash, $10.25@$10.75; bleaching powder, prime brands, Liverpool, $1.75; Continental, $1.60@$1.70.

Acids.—The only change in quotations from last week is an advance in the price of blue vitriol from $4.50 to $4.70 per 100 lbs., in large lots. For small quantities $5.25 is quoted.

Quotations per 100 lbs. are as below, unless otherwise specified, for large lots in carboys or bulk (in tank cars), delivered in New York and vicinity.

Blue vitriol	$4.70@ 5.25	Oxalic, com'l	$4.60@$5.00
Muriatic, 18 deg.	1.50	Sulphuric, 50 deg.,	
Muriatic, 20 deg.	1.62½	bulk, ton	13.50@15.50
Muriatic, 22 deg.	1.75	Sulphuric, 60 deg.	1.05
Nitric, 36 deg.	4.00	Sulphuric, 60 deg.,	
Nitric, 38 deg.	4.25	bulk	18.00@20.00
Nitric, 40 deg.	4.50	Sulphuric, 66 deg.	1.20
Nitric, 42 deg.	4.87½	Sulphuric, 66 deg.,	
		bulk	21.00@23.00

Brimstone.—The market is dull, without change in prices. There is practically no spot brimstone in store. Ex-steamer cargoes are held at $23 for best unmixed seconds, while shipments are quoted at $22@$22.25. Best thirds are about $2 less than seconds.

Pyrites.—Dullness in the superphosphate industry restricts the demand for pyrites, and little business in this line is being done at present. Prices are without change.

Quotations are f. o. b. Mineral City, Va.: Lump ore, $5 per ton, and fines 10c. per unit; Charlemont, Mass., lump, $5, and fines $4.75. Spanish pyrites 12½@13½c. per unit, New York and other Atlantic ports. Spanish pyrites contain 46 to 51 per cent of sulphur; American, from 42 to 44 per cent.

Sulphate of Ammonia.—Sellers are still resting on a quiet market. Gas liquor on spot is quoted at $3.02½@$3.05 per 100 lbs., while shipments are worth $2.95@$2.97½.

Nitrate of Soda.—The market continues quiet, with a slight decline in spot prices, while those for December and next year are firmer. Spot is quoted at $1.90 per 100 lbs.; August-November, at $1.87½, and December and next year, at $1.85. The coast market is firmer, with an advance of about 4c. As stated last week, the bottom has probably been reached, and advances are now looked for. European conditions are unchanged.

Concerning the Chilean market, Messrs. Jackson Brothers report from Valparaiso, Chile, under date of June 28, that no interest has been shown during the fortnight to operate, and transactions have been very limited. A few operations in 95 per cent have been done at 6s. 4½d., alongside, for July-September deliveries, and in 96 per cent for October-November deliveries at 6s. 6½d. alongside, whereas 96 per cent, prompt delivery, fetched 6s. 6d., alongside. We quote: 95 per cent July-August, 6s. 3½d. to 6s. 4d.; September-December, 6s. 4d. to 6s. 4½d., and 96 per cent, any delivery, at 6s. 6d., all ordinary terms, sellers. The price of 6s. 3½d., with an all-round freight of 17s. 6d., stands in 7s. 10½d. per cwt., net cost and freight, without purchasing commission. Reported sales for the second half of June foot up 155,000 quintals, coast delivery.

Phosphates.—No change is reported in the conditions affecting the phosphate industry. Business is very quiet, and prices are the same as last week. It is reported from Boston that the Bowker Fertilizer Company has negotiated a merger of their company with the American Agricultural Chemical Company, and has called a special meeting for August 4, at which the stockholders will vote upon the question of ratifying the action of the directors. It is understood that by the plan of the directors the American Agricultural Chemical Company will take over the Bowker Company on a basis not far from one share of American Agricultural preferred stock for each share of Bowker Company stock. The Bowker Fertilizer Company has a capital stock of $1,000,000.

Ocean freights continue fairly steady at the same rates as have prevailed during the past month.

We quote prices below:

Phosphates.	Per ton F. o. b.	or European Ports. Unit.	Long ton.
*Fla. hard rock (78@80%)	$6.50@7.00	6½@7d.	$10.27@11.06
*Fla. land peb. (68@73%)	3.000@3.25	4¾@5d.	6.65@ 7.00
*Fla. Peace Riv. (58@63%)	2.25@2.50	4¾@5d.	5.70@ 6.00
†Tenn., (78@82%) export	3.25%3.50	5½@6d.	8.58@ 9.36
†Tenn., 78% domestic	3.00	.....	.....
†Tenn., 75% domestic	2.75@3.00	.....	.....
†Tenn., 73@74% domestic	2.40	.....	.....
†Tenn., 70@72% domestic	2.10@2.25	.....	.....
‡So. Car. land rock	3.25	4½@5d.	5.67@ 6.30
‡So. Car. river rock	2.75@3.00	.....	.....
Algerian (63@68%)	.....	5¾@6½d.	7.48@ 8.45
Algerian (58@63%)	.....	5¼@6d.	6.30@ 7.20
Algerian (53@58%)	.....	5 @5¼d.	5.50@ 5.78

*Fernandina, Brunswick or Savannah.
†Mt. Pleasont. ‡On vessels, Ashley River.

Liverpool. July 15.

(*Special Report of Joseph P. Brunner & Co.*)

There is nothing new to report as regards the position of heavy chemicals, a steady business being done, but without any change in quotations. Soda ash is in fair request and firm at usual varying prices as to market. Nearest spot range for tierces may be called about as follows: Leblanc ash, 48 per cent, £5 15s.@£6; 58 per cent, £6 2s. 6d.@£6 7s. 6d. per ton, net cash. Ammonia ash, 48 per cent, £4 5s.@£4 10s.; 58 per cent, £4 10s.@£4 15s. per ton, net cash. Bags, 5s. per ton under price for tierces. Soda crystals are in demand at generally £3 7s. 6d. per ton, less 5 per cent for barrels, or 7s. less for bags, with special terms for certain export quarters. Caustic soda is in better demand and quotations are steady, as follows: Sixty per cent, £8 15s.; 70 per cent, £9 15s.; 74 per cent, £10 5s.; 76 per cent, £10 10s. per ton, net cash. Bleaching powder shows a slight improvement as regards demand, but £6 12s. 6d.@£6 15s. per ton, net cash, is still range for hardwood packages, with special quotations for Continental and a few other export quarters. Chlorate of potash is dull, at nominally 3d. per lb., net cash. Bicarb. soda meets with a fair inquiry at £6 15s. per ton, less 2½ per cent for the finest quality in 1 cwt. kegs, with usual allowances for larger packages; also special quotations for a few favored markets. Sulphate of ammonia is flat and values continue on the downward grade, quotations now being £12 7s. 6d.@£12 10s. per ton, less 2½ per cent for good gray, 24@25 per cent in double bags, f. o. b. here. Nitrate of soda is nominally quoted on spot at £8 15s @£9 per ton, less 2½ per cent for double bags, f. o. b. here; but there is not much going on.

METAL MARKET.

New York. July 31.

GOLD AND SILVER.

Gold and Silver Exports and Imports.
At all United States Ports in June and Year.

Metal	June. 1901.	June. 1902.	Year. 1901.	Year. 1902.
Gold:				
Exports	$5,344,844	$363,750	$29,491,226	$20,409,504
Imports	3,260,743	1,414,316	15,927,969	10,618,867
Excess. E.	$2,084,101	E. $1,050,568	E. $13,563,257	E. $9,880,637
Silver:				
Exports	$4,568,905	$3,250,066	$28,434,002	$22,534,624
Imports	1,934,357	1,802,853	15,135,186	12,351,131
Excess. E.	$2,634,548	E. $1,447,213	E. $13,298,816	E. $10,183,49

These figures include the exports and imports at all United States ports, and are furnished by the Bureau of Statistics of the Treasury Department.

Gold and Silver Exports and Imports, New York.

For the week ending July 31 and for years from January 1:

Period.	Gold.		Silver.		Total Excess Exports or Imports.
	Exports.	Imports.	Exports.	Imports.	
Week ...	$4,809,728	$116,988	$357,375	$14,117	E. $5,035,998
1902.....	24,004,088	1,442,169	15,022,960	775,091	E. 36,809,818
1901.....	25,786,523	1,736,726	18,917,324	2,289,468	40,677,653
1900.....	22,228,174	1,609,714	23,218,414	2,577,930	E. 41,258,944

Exports of gold were chiefly to France and Germany; of silver to London. Imports of both gold and silver were from the West Indies and South America.

Financial Notes of the Week.

The special feature of the week has been the gold export movement. Up to the present writing about $4,000,000 gold has been taken for shipment to Paris and Berlin. This makes about $8,000,000 sent out up to date on the movement which began two weeks ago. These exports are chiefly in settlement of loans contracted some time ago. In view of our own production and the receipts from the Yukon, they should not excite any apprehension.

The statement of the New York banks, including the 63 banks represented in the Clearing House, for the week ending July 26, gives the following totals, comparison being made with the corresponding weeks of 1901 and 1900:

	1900.	1900	1902.
Loans and discounts	$801,100,700	$867,653,400	$913,294,500
Deposits	887,841,700	942,938,500	952,097,200
Circulation	25,258,000	30,637,500	31,997,700
Specie	174,397,500	178,921,200	174,136,600
Legal tenders	75,098,900	79,942,000	79,390,100
Total reserve	$249,496,400	$258,863,200	$253,526,700
Legal requirements	221,960,425	235,734,625	238,024,300
Balance surplus	$27,535,975	$23,128,575	$15,502,400

Changes for the week this year were increases of $9,967,200 in loans, $11,404,300 in deposits, $188,100 in circulation, $967,900 in specie, $1,676,300 in legal tenders; a decrease of $206,875 in surplus reserve.

The following table shows the specie holdings of the leading banks of the world at the latest dates covered by their reports. The amounts are reduced to dollars, and comparison is made with the holdings at the corresponding date last year:

	1901.		1902.	
	Gold.	Silver.	Gold.	Silver.
N. Y. Ass'd.	$178,921,200	.....	$174,136,600	.....
England	188,379,245	.....	191,395,500	.....
France	491,429,735	$223,630,665	517,679,370	$224,311,015
Germany ...	167,685,000	71,865,000	187,595,000	69,380,000
Spain	70,015,000	84,970,000	70,925,000	97,895,000
Neth'ds	31,253,500	28,152,500	24,249,000	33,573,000
Belgium	15,830,000	7,915,000	15,380,000	7,690,000
Italy	76,080,000	9,684,500	80,935,000	10,314,500
Russia	354,920,000	37,725,000	371,995,000	44,400,000

The returns of the Associated Banks of New York are of date July 26, and the others July 24, as reported by the *Commercial and Financial Chronicle* cable. The New York banks do not report silver separately, but specie carried is chiefly gold. The Bank of England reports gold only.

The silver market has been quiet and steady. No special features have developed. India appears to be a good buyer and output is absorbed without any advance in figures.

The United States Assay Office in New York reports receipts of 59,000 oz. silver for the week.

Shipments of silver from London to the East for the year up to July 17 are reported by Messrs. Pixley & Abell's circular as follows:

	1901.	1902.	Changes.
India	£4,390,210	£3,663,945	D. £726,265
China	339,125	86,910	D. 252,215
The Straits	79,976	70,550	D. 9,426
Totals	£4,809,311	£3,831,405	D. £987,906

Arrivals for the week this year were £15,000 from the United States, £30,500 from the West Indies, and £9,000 from China; £54,500 in all. Shipments for the week, all bar silver, were £23,500 to Hong Kong, £30,000 to Bombay, £2,500 to Madras and £1,000 to Port Said; a total of £57,000.

Indian exchange has been somewhat stronger, owing to the improved position of affairs in India. The Council bills offered in London were taken at an average of 15.96d. per rupee. The demand for silver for India has been rather light.

The foreign merchandise trade of France for the six months ending June 30 is valued by the Ministry of Commerce as below:

	1901. Francs.	1902. Francs.
Imports	2,224,110,000	2,251,824,000
Exports	2,014,697,000	2,083,205,000
Excess, imports	209,413,000	168,619,000

This shows an increase of 27,714,000 fr. in imports; an increase of 68,508,000 fr. in exports, and a decrease of 40,794,000 fr. in the balance of imports.

The gold and silver movement in France for the five months ending May 31 is reported by the Ministry of Commerce as below:

	1901.		1902.		Changes.
Gold:					
Imports	149,031,000		202,740,000	I.	52,709,000
Exports	21,288,000		21,326,000	I.	38,000
Excess	Imp. 127,743,000	Imp.	181,414,000	I.	53,671,000
Silver:					
Imports	41,758,000		40,032,000	D.	1,726,000
Exports	71,283,000		38,585,000	D.	32,698,000
Excess	Exp. 29,525,000	Imp.	1,447,000	.....	

Imports of copper or nickel coins, at their face or coinage value, were 41,000 fr., against 38,000 fr. for the corresponding period in 1901; exports were 1,372,000 fr. against 141,000 fr. last year.

Prices of Foreign Coins.

	Bid.	Asked
Mexican dollars	$0.41¼	$0.43
Peruvian soles and Chilean pesos	.38¾	.42
Victoria sovereigns	4.86	4.88
Twenty francs	3.86	3.88
Twenty marks	4.77	4.85
Spanish 25 pesetas	4.78	4.82

OTHER METALS.

Daily Prices of Metals in New York.

July	Sterling Exchange	Silver N. Y. Cts.	Silver London Pence.	Copper Lake Cts. per lb.	Copper Electrolytic per lb.	Copper London £ per ton.	Tin, cts. per lb.	Lead cts. per lb.	Spelter N.Y. cts. per lb.	Spelter St. L. cts. per lb.
25	4.87¼	53	24 7/16	11¾ @12	11⅝ @11¾	52 7/16	23	4.05 @4.10	5.37½	5.10
26	4.87¼	53	24 7/16	11¾ @12	11⅝ @11¾	....	28	4.05 @4.10	5.37½	5.12½
28	4.87¼	53	24 7/16	11¾ @11⅞	11⅝	52⅝	28½	4.05 @4.10	5.37½	5.15
29	4.87¼	53	24⅜	11¾ @11⅞	11¼ @11⅝	52 7/16	28½	4.05 @4.10	5.37½	5.15
30	4.87¼	52¾	24 7/16	11¾ @11⅞	11½ @11⅝	53¾	28½	4.05 @4.10	5.37½	5.20
31	4.87¼	53⅛	24 7/16	11¾ @11 7/16	11¼ @11⅝	53⅛	28½	4.05 @4.10	5.37½	5.20

London quotations are per long ton, (2,240 lbs.) standard copper, which is now the equivalent of the former g. m. b's. The New York quotations for electrolytic copper are for cakes, ingots or wirebars; the price of electrolytic cathodes is usually 0.25c lower than these figures.

Copper.—Buyers generally are holding aloof, and in consequence the market is very dull. As consumption continues very good and the stocks in the hands of manufacturers are small, it is believed that they will soon buy more freely. In the meantime, there has been a little copper pressed for sale, which has changed hands at slightly lower prices, and we quote Lake at 11¾@11⅞c.; electrolytic in cakes, wirebars and ingots at 11½@11⅝c., in cathodes at 11¼@11⅜c.; casting copper at 11½c.

The London market for speculative sorts has been decidedly firmer, and there have been fair transactions every day at advancing prices. The market closed last Thursday at £52 12s. 6d. for spot, £52 15s. for three months. On Friday, Monday and Tuesday it was £52 8s. 9d. for spot, £52 12s. 6d. for three months; on Wednesday it advanced to £52 15s. for spot, £53 for three months, and closed on Thursday at £53 2s. 6d. and £53 7s. 6d., respectively.

Refined and manufactured sorts we quote: English tough, £56 10s.@£57; best selected, £58; strong sheets, £68; India sheets, £67; yellow metal, 6d.

Exports of copper from Atlantic ports for the week ending July 31, as reported by our special correspondents, included 2,577 long tons of fine copper.

Chilean Copper Market.—Messrs. Jackson Brothers report from Valparaiso, Chile, under date of June 28, that recent sales of bar copper foot up 780 tons. Charters for copper from Chile for the first half of 1902 show a decrease of 560 tons from 1901. About 1,000 tons of matte have changed hands during the past fortnight, but no transactions in ores are reported. Quotations for bar copper are $63.50@$63.90, Chilean gold, per metric quintal; matte, 50 per cent, $27.55, Chilean gold; ores, 10 per cent basis, $3.58, Chilean gold, per metric quintal. The latest charters for copper produce are on a basis of 40s. per ton to Liverpool or Havre.

Tin.—The market has been fairly active in spite of the weak cables from London, it being generally believed that the market there was being manipulated with reference to the Banka sale, which took place today. Consumption is very good. At the close we quote spot at 28½c., August at 28¼c.

The London market, which closed last Thursday at £127 15s. for spot, £125 for three months, was 12s. 6d. lower on Friday. On Monday it was up to £128 for spot, £125 15s. for three months, and advanced further 10s. on Tuesday, but on Wednesday it declined to £12[illegible] 10s. for spot, £125 12s. 6d. for three months. It closes on Thursday at £127 10s. for spot, £125 17s. 6d. for three months.

Statistics for the month of July show an increase in the visible supplies of 1,200 tons.

Imports of tin into the United States at Pacific ports for six months ending June 30 were 1,321 long tons, against 1,460 tons for the corresponding period in 1901, a decrease of 139 tons.

Lead.—The market is active at last prices. We quote St. Louis, 3.97½@4.05c.; New York, 4.05@4.10c.

The foreign market is slightly lower, Spanish lead being quoted at £11 1s. 3d.@£11 2s. 6d., English lead 5s. higher.

St. Louis Lead Market.—The John Wahl Commission Company telegraphs us as follows: Lead is firm and fairly active. Missouri brands are selling at 3.97½@4c.

Spanish Lead Market.—Messrs. Barrington & Holt write from Cartagena, Spain, under date of July 12, as follows: The price for lead during the week has been 62 reales per quintal on wharf, which at current exchange is equal to £10 12s. 10d. per ton of 2,240 lbs., f. o. b. Cartagena. The price of silver is 13.25 reales per ounce, and exchange has gone up 3c., making it 34.40 pesetas to £1. Exports from July 1 to July 12 were 427,014 kgs. pig lead to Marseilles and 1,487,913 kgs. to London, a total of 1,914,927 kgs.

Spelter.—The market continues to advance. The decrease in the ore production of the past few months is now making itself felt, and spelter for early shipment is in strong demand. We quote 5.20c., St. Louis; 5⅜c., New York.

The foreign market is a little lower, good ordinaries being quoted at £18 15s.; specials, 5s. higher.

St. Louis Spelter Market.—The John Wahl Commission Company telegraphs us as follows: Spelter is strong and very scarce; prompt and near-by deliveries are easily worth 5.05c., East St. Louis. Futures are obtainable at a little less.

Antimony is unchanged. We quote Cookson's at 9¾c.; Hallett's at 8¼c.; Hungarian, Japanese, Italian and U. S. Star at 8c.

Nickel.—The price is now quoted by leading producers at 40@47c. per lb. for large quantities down to ton lots, according to size and terms of order. The price for smaller lots, according to quantity, runs as high as 60c. a pound.

Platinum.—Consumption continues good. Ingot platinum in large lots brings $18.50 per oz. in New York.

Platinum ware—crucibles and dishes—best hammered metal from store, is quoted at 74c. per gram.

Quicksilver.—The New York price continues $48 per flask for large orders, with a slightly higher figure for small lots. In San Francisco prices are steady, and the quotation is $45.50@$46.50 per flask for domestic orders. For export orders $44.50 per flask is quoted. The London price remains £8 15s. per flask, with the same figure quoted from second hands.

Minor Metals and Alloys.—Wholesale prices, f. o. b. works, are as follows:

Aluminum.	Per lb.
No. 1, 99% ingots	33@37c.
No. 2, 90% ingots	31@34c.
Rolled sheets	4c. up
Alum-bronze	20@23c.
Nickel-alum	33@39c.
Bismuth	$1.50
Chromium, pure (N.Y.)	80c.
Copper, red oxide	50c.
Ferro-Molyb'um (50%)	$1.25
Ferro-Titanium (10%)	90c.
Ferro-Titanium (20@25%, N. Y.)	55c.

	Per lb.
Ferro-Tungsten (37%)	28c.
Magnesium	$2.75
Manganese, pure (N.Y.)	60c.
Mangan'e Cop. (20% Mn)	32c.
Mangan'e Cop. (30% Mn)	38c.
Molybdenum (Best)	$1.82
Phosphorus	50c.
American	70c.
Sodium metal	50c.
Tungsten (Best)	62c.

Variations in price depend chiefly on the size of the order.

Average Prices of Metals per lb., New York.

Month.	Tin. 1902.	Tin. 1901.	Lead. 1902.	Lead. 1901.	Spelter. 1902.	Spelter. 1901.
January	23.54	26.51	4.000	4.350	4.27	4.13
February	24.07	26.68	4.075	4.350	4.15	4.01
March	26.32	26.03	4.075	4.350	4.28	3.91
April	27.77	25.93	4.075	4.350	4.37	3.98
May	29.85	27.12	4.075	4.350	4.47	4.04
June	29.36	28.60	4.075	4.350	4.96	3.99
July	28.38	27.85	4.075	4.350	5.27	3.95
August	..	26.78	....	4.350	...	3.99
September	....	25.31	....	4.350	...	4.08
October	....	26.62	....	4.350	...	4.23
November	....	26.67	....	4.350	...	4.29
December	....	24.36	....	4.153	...	4.31
Year	....	26.54	....	4.334	...	4.08

Average Prices of Copper.

Month	New York Electrolytic. 1902.	1901.	Lake. 1902.	1901.	London Standard. 1902.	1901.
January	11.053	16.25	11.322	16.77	48.43	71.78
February	12,173	16.38	12,378	16.90	55.16	71.17
March	11.882	16.42	12.188	16.94	53.39	69.54
April	11.618	16.43	11.986	16.94	52.79	69.61
May	11.856	16.41	12.226	16.94	54.03	69.60
June	12.110	16.38	12.360	16.90	53.93	68.83
July	11.771	16.31	11.923	16.61	52.89	67.60
August	....	16.25	....	16.50	....	66.34
September	....	16.25	....	16.54	....	65.97
October	....	16.25	....	16.60	....	64.11
November	....	16.224	....	16.33	....	64.51
December	....	13.845	....	14.36	....	52.34
Year	....	16.117	....	16.53	....	66.79

New York prices are in cents, per pound; London prices in pounds sterling, per long ton of 2,240 lbs., standard copper. The prices for electrolytic copper are for cakes, ingots or wire bars; prices of cathodes are usually 0.25 cent lower.

Average Prices of Silver, per ounce Troy.

Month.	1902. London. Pence.	N. Y. Cents.	1901. London. Pence.	N. Y. Cents.	1900. London. Pence.	Y. Y. Cents.
January	25.62	55.56	28.97	62.82	27.30	59.30
February	25.41	55.09	28.13	61.06	27.40	59.76
March	25.00	54.23	27.04	60.63	27.59	59.81
April	24.34	52.72	27.30	59.29	27.41	59.59
May	23.71	51.31	27.43	59.64	27.56	59.90
June	24.17	52.36	27.42	59.57	27.81	60.42
July	24.38	52.88	26.96	58.46	28.23	61.25
August	....	....	26.94	58.37	28.13	61.14
September	....	....	26.95	58.26	28.85	62.63
October	....	....	26.62	57.59	29.58	63.83
November	....	....	26.12	56.64	29.66	64.04
December	....	....	25.46	55.10	29.68	64.14
Year	....	....	27.11	58.95	28.27	61.33

The New York prices are per fine ounce; the London quotation is per standard ounce, .925 fine.

DIVIDENDS.

Name of Company.	Latest Dividend Date.	Per Share.	Total.	Total to Date.
†Amalgamated Copper	Aug. 25	.50	769,439	18,887,248
†Calumet & Hecla, Mich	Aug. 26	5.00	500,000	79,350,000
Cambria Steel	Aug. 15	.75	675,000	1,350,000
Colo. Fuel & Iron, pf	Aug. 20	4.00	80,000	1,480,000
*Con. Mercur, Utah	Aug. 9	.03	30,000	360,000
*Home Oil, Cal	Aug. 10	.07½	7,500	.....
Jeff. & Clearf. Coal com	Aug. 15	5.00	75,000	105,000
Jeff. & Clearf. Coal, pf	Aug. 15	2.50	37,500	525,000
Montana Ore Purch	Aug. 15	2.00	162,000	2,484,000
†Ontario, Utah	Sept. 20	.30	45,000	14,872,000
§Quincy, Mich	Aug 5	3.00	300,000	13,570,000
*United Gold, Colo	Aug. 5	.01	39,948	119,844
†U. S. Steel Corp. com	Sept. 30	1.00	5,084,952	29,443,261
†U. S. Steel Corp. pf	Aug. 15	1.75	9,130,497	45,013,798

*Monthly. †Quarterly. §Semi-annual.

Note.—A complete list of the dividends reported this year appears on page 174.

ASSESSMENTS.

Name of Company.	Location.	No.	Delinq.	Sale.	Amt.
Annandale	Utah.		July 15	Aug. 7	.00½
Ben Butler	Utah.	9	July 23	Aug. 16	.01
Cal. Gold & Copper	Cal.	..	Aug. 5	.....	1.02¼
Chollar	Nev.	59	July 24	Aug. 14	.05
Columbus Con.	Cal.	..	Aug. 4	.....	.02
Confidence	Nev.	38	July 21	Aug. 8	.20
Con. St. Gothard	Cal.	21	Aug. 8	.....	1.05
Crown Point	Nev.	86	July 22	Aug. 12	.05
Emerald	Utah.		July 15	Aug. 7	.00½
Freemont Con.	Cal.		Aug. 23	.....	.10
Gould & Curry	Nev.	99	Aug. 15	Sept. 3	.10
Homestake	Utah.	11	Aug. 7	Aug. 26	.01
Humboldt	Utah.	2	Aug. 11	Sept. 3	.00 1-10
Jenny Lind	Cal.	..	Aug. 20	.....	.01½
Jubilee	Cal.		Aug. 20	.....	.05
Larkin	Cal.	13	July 19	Aug. 11	.02
Little Jimmie	Utah.	1	July 25	Aug. 12	.00⅝
Madsen	Utah.	5	July 21	Aug. 15	.00½
Mariana Massicano	Cal.	..	Aug. 18	.....	.03
Martha Washington	Utah.	10	July 18	Aug. 5	.01
Mayday	Cal.	..	Aug. 19	.....	.05
Mexican	Nev.	71	July 16	Aug. 6	.10
National Con.	Cal.	16	July 15	Aug. 18	.05
Old Indian	Utah.	2	July 8	Aug. 11	.00½
Pacific	Utah.	4	Aug. 10	Sept. 3	.00⅛
Paria Copper	Utah.	3	Aug. 20	Sept. 9	.00½
Potosi	Nev.	63	July 31	Aug. 31	.05
Purjue Surprise	Utah.	2	Aug. 18	Sept. 12	.00½
Savage	Nev.	..	Aug. 12	.....	.10
Union Con.	Nev.	64	July 18	Aug. 6	.10
West Morn. Glory	Utah.	12	July 31	Aug. 21	.00½
Willietta	Cal.	4	Aug. 4	Sept. 2	.01

STOCK QUOTATIONS.

NEW YORK.

Company and Location.	par val	July 24. H.	July 24. L.	July 25. H.	July 25. L.	July 26. H.	July 26. L.	July 28. H.	July 28. L.	July 29. H.	July 29. L.	July 30. H.	July 30. L.	Sales
Alice, Mont	25	.....	.....	.45	.....	.....	.....	.....	.....	40	.....	.....	.....	200
Amalgamated c., Mont	100	65.88	65.13	68.38	65.13	66.50	65.75	68 38	65.88	68.75	66.75	67.88	67.00	125885
*Anaconda c., Mont	25	.....	.....	102	.....	.....	.....	.....	.....	107¾	107	107	.....	3,800
Best & Belcher, Nev	3	.....	.....	.....	.....	16	.....	.....	.....	.....	.....	.....	.....	100
Breece, Colo	25	.....	.....	.....	.....	.....	.....	.60	.....	.....	.....	.....	.....	20
Brunswick, g., Cal	1	.....	.....	.08	.....	.07	.....	.06	.....	.....	.....	.....	.....	905
Chrisolite, Colo	50	.....	.....	.....	.....	.....	.....	.05	.....	.05	.....	.07	.....	500
Comstock T., s., Nev	100	.....	.....	.05½	.....	.....	.....	.....	.....	.....	.....	.....	.....	1,500
Comstock Bonds, Nev	100	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Con. Cal. & Va., g. s. Nev	2½	1.35	.....	1.35	.....	1.35	.....	.....	.....	1.35	.....	1.30	.....	1,200
Cripple Creek c., Colo	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Dunkin, Colo	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.08	.....	300
Elkton, g., Colo	1	.....	.....	.....	.....	.....	.....	.....	.....	.35	.....	.....	.....	300
Golden Fleece, Colo	1	.....	.....	.....	.....	.....	.....	.....	.....	.18	.....	.....	.....	500
Greene Con., c., Mex	10	28.25	28.13	28.00	.....	27.75	.....	28.60	.....	27.88	27.50	28.00	27.75	2,660
Hale & Norcross, Nev	3	.31	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	100
Horn Silver, Utah	25	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Iron Silver, Colo	20	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Isabella, g., Colo	1	.27	.....	.27	.....	.27	.....	.....	.....	.....	.....	.27	.....	3,100
Little Chief, s. l., Colo	1	.....	.....	.13	.12	.....	.....	.13	.....	.....	.....	.13	.....	1,800
Mexican, s., Nev	3	.55	.....	.....	.....	.....	.....	.....	.....	.48	.....	.52	.....	400
Mine Securities, U. S	100	7.25	6.50	7.25	6.50	7.25	6.50	7.25	6.50	.....	.....	7.25	6.50	.....
MollieGibson, g. s. Colo	5	.09	.....	.10	.....	.....	.....	.10	.....	.10	.....	.03½	.....	2,600
Moon Anchor, Colo	5	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	500
Ontario, s. l., Utah	100	.....	.....	8.58	.....	.....	.....	.....	.....	.....	.....	8.75	8 25	650
Ophir, s., Nev	3	.....	.....	.....	.....	1.30	.....	.....	.....	.....	.....	.....	.....	200
Portland, g., Colo	3	.....	.....	1.70	.....	.....	.....	1.70	.....	1.70	.....	.....	.....	300
Potosi, g. s., Nev	3	.18	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	100
Quicksilver, Cal	100	3.60	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	50
Quicksilver pf., Cal	100	9.50	.....	.....	.....	.....	.....	.....	.....	9.50	.....	.....	.....	150
Small Hopes, Colo	20	.55	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	100
Standard Con., g., Cal	10	.....	.....	3.70	.....	3.60	.....	3.65	.....	3.75	.....	.....	.....	650
Tenn. c., Tenn	25	18.00	17.00	18.00	17.00	17.13	.....	17.75	17.50	18.00	17.63	17.63	17.50	2,900
Union. c., N. C	10	4.00	3.75	3.75	.....	3.75	.....	4.00	3.75	3.88	.....	3.75	.....	3,200
White Knob, g. s., Ida	100	21.00	19.00	20.13	20.00	20.50	.....	20.50	19.00	20.50	19.00	1950	.....	300
Work, g., Colo	1	.....	.....	.....	.....	.....	.....	.06	.....	.....	.....	.....	.....	1,000

Total sales, 423,226 shares. *Per cent.

Coal, Iron and Industrial Stocks.

Am. Agr. Chem., U.S.	100	29½	.....	30	29	29½	29	30½	29	32¾	30½	.....	.....	350
Am. Agr. Chem. pf, U.S.	100	.....	.....	88	.....	88	86	90	88	91	90	90	89	.....
Am. Sm. & Ref., U.S.	100	47	46½	.....	.....	46⅜	46	46⅜	.....	48¼	.....	46⅜	46	2,500
Am. Sm. & Ref. pf, U.S.	100	.....	.....	.....	.....	.....	.....	97½	.....	97¼	.....	97	.....	710
Col. Fuel & I., Colo.	100	98	97¼	98	97	98	97	101¾	97	102¾	98¼	100¾	98	75,450
Col. & H. C. & I., Colo.	100	.....	.....	.....	.....	17½	.....	.....	.....	.....	.....	17	.....	200
Crucible Steel, U. S.	100	.....	.....	21½	.....	21½	21⅜	21⅝	21¼	21⅜	21¼	21¼	21⅛	805
Crucible Steel, pf, U.S.	100	85⅝	.....	85⅞	85¾	85¼	.....	86	85¾	86	85⅞	86	85⅛	1,495
Int'l S. Pump, U.S.	100	54½	53¾	54	53⅝	53¾	.....	54	53¾	.....	.....	.....	.....	1,600
Int'l S. Pump pf, U.S.	100	.....	.....	.....	.....	93	90½	.....	.....	93	91¼	.....	.....	.....
Mong. R. Coal, Pa	100	12⅜	.....	.....	.....	.....	.....	12⅜	.....	12⅜	.....	12⅜	.....	300
Mong. R. Coal pf, Pa.	100	39½	.....	39¾	.....	.....	.....	39¾	.....	39¾	.....	39¼	39¼	1,310
National Lead, U.S.	100	22	21½	21¼	21½	21¾	21¼	21⅝	21⅝	21⅜	21¼	.....	.....	3,400
National Lead pf, U.S.	100	.....	.....	.....	.....	88	.....	88½	.....	.....	.....	.....	.....	200
Phila Nat. Gas	100	49	48¾	48¾	.....	.....	.....	48¾	.....	49	48¾	49	.....	743
Phila Nat. Gas, pf	100	49¾	49¼	49	.....	50	.....	.....	.....	50	.....	.....	.....	113
Pittsburg Coal, Pa	100	26¾	26½	27	26¾	26⅞	.....	26¾	.....	26¾	.....	26⅝	26¼	2,650
Pittsburg Coal pf, Pa.	100	90	.....	90¼	.....	90¼	.....	90¼	.....	90¼	90	90½	.....	568
Republic I & S., U.S.	100	18½	18	19	18¼	19	18¼	19	18¼	19¼	18¾	18¼	18¼	12,900
Republic I. & S., pf, U.S.	100	74¾	74⅛	75⅛	74⅝	75¼	75¼	75¼	75	75⅛	.....	75	74⅝	6,380
Sloss-Shef S. & I., Ala.	100	35	33½	34½	34	36½	.....	36	.....	37	36	37¾	36	800
Sloss-Shef S. & I. pf, Ala.	100	82¼	81	82⅛	.....	82¾	82	83	82	.....	.....	83	82	100
Standard Oil, U.S.	100	695	.....	694	.....	692	690	693	.....	692	.....	690	.....	212
Tenn. C. I. & R. R., Ala.	100	67¾	66¼	69½	67¼	69⅜	68¼	69½	67¼	69½	67¾	68¾	67¾	59,185
U. S. Cast I. Pipe, U.S.	100	12⅜	11¾	12¼	12	12	11⅜	12¼	.....	11⅜	.....	.....	.....	1,400
U.S.C. I. Pipe, pf, U.S.	100	46	45¾	46¼	46	.....	.....	47	.....	47	.....	46¾	.....	1,100
U. S. Red. & Ref., Colo.	100	.....	.....	.....	.....	38½	38	39	38	38	.....	38	35½	100
U.S. Red. & Ref. pf, Colo	100	62½	62¼	.....	.....	63	61⅜	63	61¾	.....	.....	63	60⅝	200
U.S. Steel Corp., U.S.	100	40	39⅜	39⅝	39½	40⅛	39¾	40¼	39¾	40⅛	39⅛	39⅞	39½	57,800
U.S. Steel Corp. pf, U.S.	100	90⅛	90	90	89⅝	90¼	89¾	90⅛	89⅞	90	89⅜	89⅛	89½	29,580
Va.-Car Chem., U.S.	100	69½	69	69	68⅝	69¼	68⅜	69¼	68¾	68¼	68⅜	68⅜	68	3,900
Va.-Car Chem. pf, U.S.	100	130	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	100
W'house Elect., Pa.	50	207¼	210	209	210	.....	.....	214	.....	210½	.....	209	214	804
W'house Elect., pf, Pa.	50	.....	.....	.....	.....	218	216	.....	.....	.....	.....	.....	.....	.....

Total sales, 423,226 shares. †Ex-dividend

BOSTON, MASS.*

Name of Company.	par val	Shares listed.	July 24. H.	July 24. L.	July 25. H.	July 25. L.	July 26. H.	July 26. L.	July 28. H.	July 28. L.	July 29. H.	July 29. L.	July 30. H.	July 30. L.	Sales.
Adventure Con., c	$25	100,000	23.88	23.50	.....	.....	23.00	.....	23.50	22.25	23.88	.....	23.13	.....	890
Allonez	25	80,000	2.75	.....	2.75	.....	.....	.....	.....	.....	2.75	.....	.....	.....	130
Amalgamated, c	100	1,538,879	.....	.....	66.50	65.75	66.75	66.00	68.50	66.00	68.75	66.88	68.00	67.25	17,385
Am. Gold Dredging	15	90,000	3.00	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	200
Am. Z. L. & Sm	25	60,000	15.25	14.00	14.75	14.00	15.00	14.75	.....	.....	.....	.....	11.00	.....	1,400
Anaconda, c	25	1,200,000	27.00	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	10
Arcadian, c	25	150,000	5.63	5.25	5.25	.....	5.38	5.25	5.00	.....	5.00	.....	5.13	5.00	1,215
Atlantic, c	25	40,000	31 00	.....	31.00	30.00	30.50	30.00	31.00	.....	30.50	29.75	30 00	29.00	760
Bingham Con., g. s.	50	150,000	34.82	34.50	34.50	.....	.....	.....	34.75	34.25	.....	.....	35.00	.....	945
Bonanza Dev	10	300,000	.60	.55	.....	.....	.....	.....	.60	.55	.....	.....	.....	.....	800
Cal. & Hecla, c	25	100,000	5.70	.....	5.71	5.70	.....	.....	.....	.....	5.70	.....	5.63	.....	27
Centennial, c	25	90,000	19.75	19.63	19.25	.....	19.00	.....	20.25	19.00	20.75	20.00	20.00	.....	1,080
Central Oil	25	60,050	8.00	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	50
Cochiti	25	182,250	.....	.....	.....	.....	.....	.....	51	.50	.85	.....	1 25	.90	2,775
Con. Mercur, g	5	1,000,000	2.13	2.00	2.00	2.00	2.06	.....	2.06	2.00	2.13	2.06	2.13	2.06	5,065
Cont'l Zinc	25	22,00	19.50	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	80
Copper Range Con	100	285,000	58.88	58.00	58.50	57.75	58.25	57.50	58.88	57.00	60.38	59.00	60.25	59.25	13,801
Daly-West., g. s.	20	180,000	52.00	.....	51.75	.....	.....	.....	.....	.....	51.75	.....	51.38	51.00	420
Dominion Coal	100	150,000	.....	.....	13700	.....	.....	.....	13700	13600	136¾	13500	.....	.....	5,903
Dominion Coal, pf	100	30,000	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Dominion I & S	100	100,000	59 25	58.50	64.50	59.00	64.50	63.50	67.63	65.00	68.00	65 75	67 25	66.50	11,980
Elm River	12	100,000	4 13	3.50	.....	.....	.....	.....	3.88	3.25	.....	.....	3.75	3.50	2,953
Franklin, c	25	100,000	11.63	11.50	11.50	.....	.....	.....	10.50	.....	10.50	.....	12.00	.....	245
Guanajuato Con	5	385,000	.....	.....	4.00	3.00	3.50	.....	.....	.....	3.75	3.50	3.50	.....	1,930
Isle Royale Con., c	25	150,000	14.50	14.25	14.50	.....	15.75	.....	15.25	.....	15.00	.....	15.00	14.50	1,730
Mass Con., c	25	100,000	18.38	17.75	.....	.....	18.25	.....	18.50	18.25	18.50	18.00	18.25	.....	1,815
Mayflower, c	25	100,000	2.50	.....	.....	.....	.....	.....	2.50	.....	.....	.....	2.00	.....	230
Michigan, c	25	100,000	.....	.....	.....	.....	.....	.....	.....	.....	12.00	.....	.....	.....	145
Mohawk, c	25	100,000	44.50	44.00	44.50	44.00	.....	.....	45.25	41.00	45.25	45.00	45.50	45.00	2,040
Mont. Coal & Coke	25	200,000	.....	.....	3.50	3.00	.....	.....	.....	.....	3.00	.....	.....	.....	335
Mont'l & Boston, c	5	570,000	2.13	.....	2.38	2.25	.....	.....	2.25	.....	2.25	2.00	2.50	2.13	1,985
N. E. Gas & Coke	100	.....	4.75	4.25	4.50	.....	.....	.....	4.75	.....	.....	.....	4.63	4.50	1,119
New Idria	5	100,000	.....	.....	8.50	.....	.....	.....	.....	.....	.....	.....	.....	.....	50
Old Colony, c	25	100,000	3.00	.....	.....	.....	.....	.....	3.00	.....	.....	.....	.....	.....	200
Old Dominion, c	25	150,000	19.88	19.63	20.00	.....	.....	.....	19.75	19.00	20.00	19.75	19.00	.....	412
Osceola, c	25	96,150	62.50	61.25	62.75	61.00	.....	.....	61.75	61.50	62.00	61.50	60.50	60.00	882
Parrot, s. c	10	229,850	20.00	.....	.....	.....	.....	.....	.....	.....	29.00	.....	.....	.....	225
Phoenix Con., c	25	100,000	.....	.....	.....	.....	5.00	4.50	.....	.....	.....	.....	.....	.....	70
Quincy, c	25	100,000	.....	.....	.....	.....	13700	.....	.....	.....	.....	.....	13100	.....	42
Rhode Island, c	25	100,000	3.00	.....	3.00	.....	3.00	2.50	.....	.....	.....	.....	3.00	.....	905
Santa Fe, g. c	10	250,000	2.50	2.13	2.50	2.13	2.13	2.00	2.18	2.00	.....	.....	2.25	2.13	2,590
Shannon, c	10	186,296	13 25	13.00	13.25	12.50	13.38	12.75	.....	.....	.....	.....	12.75	.....	1,265
Tamarack, c	25	60,000	17800	.....	.....	.....	18000	17700	18000	17700	18000	17700	18000	.....	91
Trimountain, c	25	100,000	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Trinity, c	25	160,000	12.75	12.38	12.50	12.25	12.50	.....	12.50	12.25	12.50	12.25	12.75	12.25	1,531
United Copper	100	450,000	.....	.....	.....	.....	.....	.....	34.38	.....	35.00	34.63	34.98	34.75	1,000
United States, g.	25	250,000	22.00	21.63	21.75	21.50	22.00	21.50	22.00	21.00	22.00	21.75	21.75	.....	4,491
U. S. Oil	25	240,000	18.25	17.38	17.88	17.25	17.75	17.50	17.50	17.25	18 50	17.25	17.38	.....	11,072
Utah Con., g.	5	300,000	22.00	21.50	21.25	21.00	20.25	.....	20.75	19.75	22.00	20.75	21.75	.....	2,575
Victoria, c	25	100,000	6.38	6.25	6.25	.....	.....	.....	6.00	.....	.....	.....	6.25	6.00	420
Washington, c	25	60,000	.....	.....	.....	.....	.....	.....	.25	.....	.....	.....	.....	.....	50
Winona, c	25	100,000	5.25	5.00	4.75	.....	5.00	.....	.....	.....	.....	.....	4.50	.....	390
Wolverine, c	25	60,000	58.00	57.00	60.00	58.00	60.00	.....	.....	.....	60.00	.....	60.00	.....	615
Wyandot, c	25	100 000	1.75	1.63	.....	.....	.....	.....	.....	.....	1.63	1 50	1.75	.....	485

* Official Quotations Boston Stock Exchange. Holiday. Total sales, 110,704 shares. *Ex-dividend.

PHILADELPHIA, PA. §

Name and Location of Company.	par val	July 24. H.	July 24. L.	July 25. H.	July 25. L.	July 26. H.	July 26. L.	July 28. H.	July 28. L.	July 29. H.	July 29. L.	July 30. H.	July 30. L.	Sales
Am. Alkali, Mich	$50	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Am. Cement	10	7.38	7.25	.....	.....	7.38	.....	7 38	.....	7.25	.....	.....	.....	1,755
Cambria Iron, Pa	50	.....	.....	48	.....	.....	.....	.....	.....	.....	.....	.....	.....	12
Cambria Steel, Pa	50	.27	.26½	27.13	.26¾	.27½	.27	27.63	.27¾	26.63	27.13	.27½	.27	30,029
Susq. I. & S., Pa	10	2.75	.....	2.63	.....	2.75	.....	2.75	.....	2.75	.....	2.75	.....	650
†United Gas I., Pa	50	1.09½	1.09	1.09¾	1.09⅛	1.09½	1.09	1.09¼	1.09	1.09¼	1.08¾	1.09¼	1.08¾	1,968
Penn. Steel, pfd	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Warwick I. & Steel	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

§Reported by Townsend, Whelen & Co., 309 Walnut St., Philadelphia, Pa. Total sales 39,414 shares.
†Ex-privileges.

STOCK QUOTATIONS.

COLORADO SPRINGS, COLO.*

Name of Company.	par val	July 21. H.	July 21. L.	July 22. H.	July 22. L.	July 23. H.	July 23. L.	July 24. H.	July 24. L.	July 25. H.	July 25. L.	July 26. H.	July 26. L.	Sales
Acacia	$1	.07	.06⅝	.07¼	.03½	.08	.06	.07	.06	.06¾	.05⅝	.67	68	3,000
Alamo	1	.03½	.03	.03⅝	.03	.03¾	.03	.03½	.....	.03½	.02⅞	.03⅝	.03	.....
Am. Con	1	.02	.01	.02	.01⅜	.02	.01½	.02	.01½	.02	.01⅜	.02	.....	.....
Anaconda	1	.20	.....	.20	.....	.20	.....	.18	.....	.18	.....	.18	.....	.....
Argentum Jun	1	.02	.....	.01¼	.....	.....	.....	.....	.....	.....	.....	.....	.....	10,000
Battle Mt. Con	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Ben Hur	1	.....	.....	.03	.....	.03	.....	.04	.....	.04	.....	.....	.....	.....
Black Bell	1	.02⅛	.....	.02¾	.....	.02⅛	.....	.03	.....	.02½	.....	.02½	.....	.....
Blue Bell	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Butterfly Terrible	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
C. K. & N	1	.05¼	.05	.05⅜	.05⅛	.05⅛	.05¼	.06⅜	.05⅛	.06⅛	.05⅛	.06½	.05⅛	3,500
Columbine-Victor	1	.06	.....	.05	.....	.04½	.....	.04	.....	.05	.....	.04½	.....	.....
C. C. Con	1	.06⅛	.06	.06⅛	.06	.06½	.06	.06⅜	.06	.06¼	.06	.06⅛	.06	1,000
Dante	1	.02½	.02	.02¾	.02	.02⅜	.03	.03	.....	.02½	.02	.02	.....	1,000
Dr. Jack Pot	1	.10⅝	.10⅛	.10⅜	.10⅛	.11	.10¼	.11	.10⅛	.11	.10⅛	.10½	.....	.....
Elkton Con	1	.37	.36⅞	.35¾	.35⅛	.33½	.32⅝	.34	.33⅛	.34⅛	.34	.33¾	.32½	113517
El Paso	1	.50⅜	.50	.51	.50	.50⅝	.50	.50⅛	.50¼	.50¾	.50¼	.50⅛	.50	12,122
Fanny Rawlings	1	.05	.04½	.05½	.04½	.05⅝	.04¾	.05⅛	.04½	.05½	.04½	.06½	.04½	1,000
Findley	1	.08	.....	.....	.....	.08	.....	.07½	.....	.07½	.....	.08½	.07½	10,000
Gold Dollar Con	1	.03½	.03¾	.03⅝	.03¼	.03⅜	.03¾	.03⅜	.03⅜	.03⅝	.03¾	.03⅞	.03¾	.....
Golden Cycle	1	.70	.....	.70	.....	.....	.....	.60	.....	60	.....	.....	.....	.....
Gold Fleece	1	.18	.10	.18	.....	.18	.....	.18	.10	.18	.10	.18	.12	.....
Gold Sov'n	1	.02½	.....	.....	.....	.02½	.....	.02⅝	.02⅜	.02⅝	.....	.....	.....	1,000
Hart	1	.04	.....	.04	.....	.04	.....	.04	.....	.04	.....	.04	.....	.....
Ida May	⅛	.16	.....	.16	.....	.16	.....	.16	.....	.16	.....	.16	.....	.....
Isabella	1	.25⅜	.24⅞	.26	.25½	.25¾	.25¼	.27	.25⅛	.26	.25¼	.26¼	.25¾	12,600
Jack Pot	1	.11⅞	.10⅜	.11¼	.11	.11⅜	.11	.10	.....	.....	.....	.12	.10	3,000
Last Dollar	1	.70	.60	.70	.62	1.00	.60	.80	.60	.70	.65	.75	.70	1,000
Lexington	1	.05	.04⅜	.05	.04¾	.05	.04¾	.05	.04⅞	.05	.04¼	.05¼	.04½	.....
Little Puck	1	.04	.03¾	.04	.03⅝	.04	.03¾	.03⅞	.03¾	.03⅞	.03¾	.03¾	.03⅝	1,000
Matoa	1	.....	.....	.....	.....	.....	.....	.07⅜	.....	.07	.....	.07	.....	.....
Mol. Gibson	1	.10⅛	.08	.....	.....	.....	.....	.10¼	.08	.10¾	.....	.10¾	.....	3,000
National	1	.01¾	.....	.01⅜	.....	.01½	.....	.01⅝	.....	.01⅝	.....	.02	.....	.....
Nellie V	1	.02	.01⅜	.02	.01⅜	.01⅝	.01¾	.01⅜	.01¼	.01⅜	.01⅜	.02	.01⅜	5,000
New Haven	1	.93	.02¼	.02½	.....	.03	.02¾	.02¾	.....	.02¾	.....	.03¼	.02¾	1,000
Pappoose	1	.02	.....	.02	.....	.02	.....	.02	.....	.02	.....	.02	.....	.....
Pharmacist	1	.03¼	.02⅞	.03⅛	.02⅞	.03	.02¾	.03	.02⅜	.03	.....	.03¼	.02⅝	4,300
Pinnacle	1	.05¼	.04¾	.05½	.04	.05¼	.04	.05⅛	.....	.05¼	.....	.05⅛	.....	5,000
Pointer	1	.01⅜	.....	.02¼	.01⅝	.01⅜	.....	.02¼	.01½	.02	.01⅜	.02	.....	30,00
Portland	1	1.75	1.70	1.85	1.76	1.85	1.65	1.90	1.75	1.90	1.70	1.85	1.75	900
Prince Albert	1	.02	.....	.02	.....	.....	.....	.02	.....	.02	.....	.02⅜	.02	.....
Rose Maud	1	.02	.....	.02	.....	.02	.....	.02	.....	.02	.....	.02	.....	.....
Sunset Eclipse	1	.03	.02⅜	.03	.02¾	.03	.02¾	.02¾	.....	.03¼	.02⅞	.03¼	.....	5,000
Uncle Sam	1	.02	.....	.02	.....	.02	.....	.....	.....	.02	.....	.02	.....	.....
Vindicator Con	1	.95	.87½	1.00	.....	.88	.....	.....	.....	.....	.....	1.00	.90	260
Work	1	.05¼	.04¾	.06	.04¾	.05¼	.04¾	.04¾	.....	.05¼	.04¾	.05	.04⅝	2,000

*Colo. Springs Mining Stock Exchange. All mines are in Colorado. Total sales 200,839 shares.

Colorado Springs (*By Telegraph.*)

Name of Company.	par val	July 24. H.	July 24. L.	July 25. H.	July 25. L.	July 26. H.	July 26. L.	July 28. H.	July 28. L.	July 29. H.	July 29. L.	July 30. H.	July 30. L.
Acacia	$1	.07	.06	.06¼	.05⅞	.07	.06	.06¼	.06	.06¾	.06	.06⅜	.06
Alamo	1	.03½	.03	.03½	.02⅞	.03½	.03	.03⅜	.03	.03½	.03	.03½	.03
Anaconda	1	.18	.12	.18	.12	.17	.12	.15	.10	16	16	.10	
Battle Mountain	1	.12	.10	.12	.10	.12	.10	.12	.10	.12	.10	.11	.09
Cripple Creek Con	1	.06¾	.06	.06⅜	.05¼	.06⅜	.06	.06⅜	.06	.06¼	.06	.06¼	.06
Doctor Jack Pot	1	.11	.10⅜	.11	.10⅜	.11	.10⅜	.10¾	.10¼	.11	.10¼	.10¾	.10¼
Elkton, Con	1	.34	.33⅞	.34⅛	.34	.33¼	.32⅝	.32⅝	.33⅛	.33⅜	.33⅛	.34	.33¼
Fanny Rawlings	1	.05½	.04½	.05¾	.04½	.05½	.04⅝	.05½	.04⅝	.05⅝	.04⅝	.05½	.04⅝
Gold Dollar Con	1	.03⅞	.03¾	.03⅞	.03⅜	.03⅞	.03¾	.04	.03¾	.04	.03¾	.03⅞	.03¾
Golden Fleece	1	.18	.10	.18	.10	.18	.12	.18	.11	.18	.12⅛	.18	.12⅛
Isabella	1	.27	.25½	.26	.25¼	.26¼	.25¾	.26⅛	.25⅝	.26¼	.25⅜	.25½	.25½
Jack Pot	1	.11	.10	.11	.10	.12	.10	.12	.10	.12	.10¾	.12	.11
Last Dollar	1	.80	.60	.79	.65	.75	.70	.80	.70	.75	.75	.78	.75
Mollie Gibson	1	.10½	.08	.10⅝	.08	.10¼	.08	.10	.08	.12	.05	.10	.05
Moon Anchor	1	.12⅜	.05	.12⅛	.05	.12	.05	.12	.05	.10½	.05	.12	.05
Pharmacist	1	.03	.02⅛	.03	.02¼	.....	.....	.....	.....	.03	.02¾	.03	.02⅛
Portland	1	1.90	1.75	1.80	1.70	1.85	1.75	1.85	1.75	1.85	1.75	1.85	1.75
Work	1	.05⅛	.04⅞	.05¼	.04¾	.05	.03⅝	.05	.04¾	.05	.04½	.05	.04⅜

MEXICO. July 18

Name of Company	Shares.	Last div'd	Prices. Bid.	Prices. Ask.
Durango:				
Ca. Min. de Penoles	2,500	$50.00	$4,150	$4,400
Guananjuato:				
Angustias, Pozos	2,400	5.00	70	75
Cinco Senores y An., aviada	2,000	15.00	315	325
Cinco Senores y An., aviada	400	10.00	265	275
Providencia, SanJuan de la Luz	6,000	2.00	230	235
Guerrero:				
Garduno y Anexas	7,200	.....	30	50
Hidalgo:				
Amistad y Concordia	9,800	4.32	59	60
Carmen, aviada	1,100	.....	200	250
Ca. Real del Monte	2,554	.....	450	550
El Encino, aviador	1,120	.....	40	.....
Guadalupe Fresnillo y Annexas	1,000	.....	220	300
La Blanca, aviada	1,536	.....	595	605
La Blanco, aviada	768	.....	355	370
Maravillas y An., aviador	1,680	.....	150	180
Maravillas el Lobo	1,000	.....	150	200
Palma y An., aviador	1,800	.....	9	12
Sta. Gertrudis y An., aviadas	9,000	.....	9	10
Sta. Gertrudis y An., aviadora	28,800	0.50	71	72
Santo Tomas Apostol aviador	5,100	.....	5	6½
San Rafael y An., Trompillo	1,200	12.00	700	710
San Rafael y An., aviada	1,200	4.00	320	330
Solodat, aviada	960	10.00	400	415
Sorpressa, aviada	960	5.00	195	200
Mexico:				
Alacran	2,400	.....	$45	$55
La Esperanza (El Oro)	3,000	$10.00	770	790
Michoacan:				
Luz de Borda, aviadora	3,000	.....	57	60
Luz de Borda, aviada	1,000	.....	15	18
San Luis Potosi:				
Concepcion y An	3,000	.....	70	85
El Barreno, aviador	2,000	2.00	25	28
Sta. Maria de la Paz	2,400	10.00	630	640
San Diego y Annexas	2,400	4.00	80	85
Zacatecas:				
Candelaria y Pinos	2,500	.....	220	240
San Carlos y Annexas	2,500	10.00	220	225
Sta. Maria de Gaud	2,500	10.00	310	315
Miscellaneous:				
Bartolome de Medina	2,000	1.50	60	70
Guadalupe Hacienda	10,000	4.00	230	240
La Luz Hac. (Pachuca)	3,750	.....	96	100
La Reina (Chihuahua)	192	.....	2,500	3,500
Naica (Chihuahua)	100	.....	4,500	5,000
Natividad (Oaxaca) aviador	1,800	4.00	460	500
National (Oaxaca) aviador	1,800	4.00	430	450
San Francisco Hac	6,000	2.00	155	160
Santa Ana Huantla Morelos	4,000	.....	50	70
Union Hacienda	3,000	5.00	160	170

ST. LOUIS, MO.* July 21.

Name.	Shares.	Par Val.	Bid.	Ask.
Am.-Nettie, Colo	300,000	$10	$0.65	$0.75
Catherine Lead, Mo.	50,000	10	3.00	4.00
Central Coal & C.	18,750	100	66.00	67.40
Central C. & C., pf.	18,750	100	.....	.....
Central Lead, Mo	10,000	100	130.00	135.00
Columbia Lead, Mo.	50,000	10	11.00	13.00
Con. Coal, Ill.	50,000	100	19.00	21.00
Doe Run Lead Co.	10,000	100	128.00	135.00
Granite Bimet, Mt.	1,000,000	10	1.87	2.15
St. Joe Lead, Mo.	300,000	10	17.00	20.00

*From our Special Correspondent.

SPOKANE, WASH.* July 25.

Name of Company.	Par Val.	H.	L.	Sales.
American Boy	$1	.07½	.07⅛	500
Black Tail	1	.11⅛	.10¾	4,000
Lone Pine-Surp. Con	1	.06⅜	.05¾	15,000
Princess Maud	1	.02¼	.02⅛	.....
Quilp	1	.32	.30	.....
Rambler Cariboo	1	.82	.81	.....
Republic	1	.12⅜	.10⅜	52,500
San Poil	1	.....	.....	.....
Tom Thumb	1	.17	.15¾	10,000

Total sales 82,000 shares. *Reported by Hunner & Harris.

LONDON. July 19.

Name and Country of Company	Authorized Capital.	Par value.	Last dividend. Amt.	Last dividend. Date	Quotations. Buyers.	Quotations. Sellers.
	£	£. s. d.	s. d.		£. s. d.	£. s. d.
Anaconda, c. s., Montana	6,000,000	5 0 0	2 0	May, 1902	5 3 9	5 6 3
Copiapo, c., Chile	225,000	2 0 0	2 6	Dec., 1901	2 0 0	2 5 0
De Lamar, g. s., Idaho	80,000	1 0 0	2 0	July, 1902	18 9	1 1 3
Enterprise, g., British Col	200,000	1 0 0			2 6 0	7 6 0
El Oro, g Mexico	1,000,000	1 0 0	1 6	June, 1902	1 6 3	1 8 9
Frontino & Bolivia, g., Colombia	140,000	1 0 0	3 0	July, 1901	1 1 3	1 3 9
Hall Mg. & Sm., c. s., British Col	325,000	1 0 0			1	1 6
Le Roi, g., British Col	1,000,000	5 0 0	5 0	Nov., 1899	1 6 3	1 8 9
Le Roi No. 2, g., British Col	120,000	5 0 0	5 0	May, 1902	3 5 0	3 7 6
Montana, g. s., Montana	660,000	1 0 0	6	April, 1899	3 6	4 0
Stratton's Independence, Colorado	1,100,000	1 0 0	6d	April, 1902	5 0	6 0
St. John del Rev., g., Brazil	600,000	1 0 0	6	June, 1902	16 6	17 6
Utah Con., g., (High. Boy), Utah	300,000	1 0 0	5 0	Dec., 1901	4 5 0	4 15 0
Ymir, g., British Col	200,000	1 0 0	1 0	Mar., 1902	7 6	12 6
European:						
Linares, l., Spain	45,000	3 0 0	7 0	March, 1901	3 0 0	4 0 0
Mason & Barry, c., sul., Port'g'l	185,145	1 0 0	13 0	May, 1902	3 7 6	3 12 6
Rio Tinto, c., Spain	1,625,000	5 0 0	37 6	May, 1902	43 17 6	44 2 6
Rio Tinto, pref., Spain	1,625,000	5 0 0	2 6	May, 1902	6 0 0	6 5 0
Tharsis, c., Spain	1,250,000	2 0 0	12 0	May, 1902	4 17 6	5 5 0
Australia and New Zealand:						
Assoc. Gold Mines, W. Australia	500,000	1 0 0	1 6	Jan., 1900	1 10 0	1 12 6
Br'ken Hill Pr'p., s., N. S. Wales	384,000	8 0	1 0	Nov., 1901	1 12 6	1 13 9
Great Bo'd'r Pr'p., W. Australia	175,000	2 0	6	July, 1902	18 9	19 3
Hannan's Brownhill, g., W. Australia	155,000	1 0 0	5 0	Aug., 1901	2 16 3	2 18 9
Ivanhoe Gold Corp. W. Australia	1,000,000	5 0 0	3 0	Jan., 1902	7 6 3	7 8 9
Kalgurlie, g., W. Australia	120,000	1 0 0	rts.	Oct., 1899	3 1 3	3 3 9
Lake View Cons., g., W. Australia	250,000	1 0 0	5 0	Oct., 1901	3 0 0	3 2 6
Mt. Lyell M. & R. I., c., Tasmania	725,000	3 0 0	1 0	July, 1902	2 13 9	2 16 3
Mt. Morgan, g., Queensland	1,000,000	1 0 0	3	May, 1902	3 13 9	3 16 3
Waihi, g., New Zealand	320,000	1 0 0	2 6	Mar., 1902	5 5 0	5 7 6
Indian:						
Champion Reef, g., Colar Fields	220,000	10 0	3 6	May, 1902	5 18 3	5 18 9
Mysore Gold, Colar Fields	250,000	10 0	4 0	July, 1902	6 17 6	7 0 0
Nundydroog, g., Colar Fields	242,000	10 0	1 3	July, 1902	1 18 9	2 1 3
Ooregum, g., Colar Fields	280,000	10 0	9	Aug., 1902	2 5 0	2 7 6
Ooregum, pref., g., Colar Fields	240,000	10 0	9	Aug., 1902	2 16 3	2 18 9
African:						
British S. Africa, chartered S. Africa	5,000,000	1 0 0	rts.	May, 1899	3 6 3	3 8 9
Cape Copper, S. Africa	600,000	2 0 0	8 0	Jan., 1902	3 10 0	3 15 0
Cape Copper, pref., S. Africa	150,000	2 0 0	8 0	Jan., 1902	3 15 0	4 0 0
City and Sub'n (New), g., Transvaal	1,360,000	4 0 0	3 0	Aug., 1899	7 0 0	7 5 0
Crown Reef, g., Transvaal	120,000	1 0 0	10 0	May, 1902	17 10 0	18 0 0
De Beers Con., d., pref., Cape Colony	1,975,600	2 10 0	.....	.....	19 15 0	20 0 0
De Beers Con., def.	2,100,000	2 10 0	.....	.....	22 17 6	23 0 0
Ferreira g., Transvaal	90,000	1 0 0	10 0	Jan., 1902	23 15 0	24 10 0
Geldenhuis Est., g. Transvaal	200,000	1 0 0	10 0	June, 1899	6 17 6	7 2 6
Henry Nourse, g., Transvaal	125,000	1 0 0	10 0	June, 1899	9 7 6	9 12 6
Jagersfontein, d., Orange F. S.	1,000,000	5 0 0	6 0	Dec., 1900	25 15 0	26 5 0
Joh'n'b'g Con. Invest., S. Africa	2,750,000	1 0 0	2 0	Nov., 1899	3 7 6	3 10 0
Jubilee, g., Transvaal	50,000	1 0 0	5 0	July, 1899	6 17 6	7 2 6
Langlaagte Est., g., Transvaal	470,000	1 0 0	3 0	Aug., 1899	4 2 6	4 7 6
May Con., g., Transvaal	200,000	1 0 0	3 0	July, 1901	4 17 6	5 0 0
Meyer & Charlton, g., Transvaal	160,000	1 0 0	3 0	July, 1902	5 17 6	6 2 6
Namaqua, c., Cape Colony	200,000	2 0 0	3 0	Feb., 1902	3 2 6	3 7 6
Primrose (New), g., Transvaal	300,000	1 0 0	6 0	June, 1899	4 5 0	4 10 0
Rand Mines, g., S. Africa	448,989	5 0	4 0	July, 1899	11 18 9	12 1 3
Robinson, g., Transvaal	2,750,000	5 0 0	10 0	Dec., 1901	11 10 0	11 15 0
Sheba, g., Transvaal	1,100,000	1 0 0	5 0	Feb., 1902	1 5 0	1 7 6
Wolhuter, g., Transvaal	860,000	4 0 0	2 0	Jan., 1899	5 5 0	5 10 0

c.—Copper. d.—Diamonds. g.—Gold. l.—Lead. s.—Silver.

PARIS. July 15.

Name of Company.	Country.	Product.	Capital Stock.	Par value.	Latest divs.	Prices. Opening	Prices. Closing
			Francs.	Fr.	Fr.	Fr.	Fr.
Acieries de Creusot	France	Steel mfrs	27,000,000	2,000	85.00	1,755.00	1,760.00
" " Firminy	"	" "	3,000,000	500	200.00	2,475.00	2,400.00
" " Huta-Bank	Russia	Iron and Steel		500		3,165.00	3,220.00
" " la Marine	France	Steel mfrs	20,000,000	500	65.00	1,370.00	1,359.00
Anzin	"	Coal			320.00	5,475.00	5,400.00
Boleo	Lower Cal	Copper		500	176.00	1,290.00	1,250.00
Briansk	Russia	Coal and Iron		500		229.00	195.00
Champ d'Or	S. Africa	Gold	3,375,000	25	3.75	32.25	24.75
Courrieres	France	Coal	600,000	300	90.00	2,620.00	2,597.00
Dombrowa	Russia	"		500	75.00	960.00	950.00
Dynamite Centrale	France	Explosives		500	19.00	551.00	554.00
Escombrera-Bleyberg	Spain	Lead		500	50.00	735.00	739.00
Fraser River	Brit. Col'mb	Gold	250,000	25		6.00	6.00
Huanchaca	Bolivia	Silver	40,000,000	125	5.00	95.50	92.25
Laurium	Greece	Zinc and Lead	16,300,000	500	25.00	350.00	340.00
Malfidano	Italy	Zinc	12,500,000	500	12.50	335.00	321.00
Metaux, Cie. Fran. de	France	Metal dealers	25,000,000	500	22.50	484.00	485.00
Mokta-el-Hadid	Algeria	Iron	18,312,500	500	35.00	858.00	842.00
Napthe Baku	Russia	Petroleum				433.00	423.50
Napthe Nobel	"	"				517.50	521.00
" " parts	"	"				10,500.00	10,500.00
Nickel	N. Caled'nia	Nickel	10,000,000	250	20.00	450.00	440.00
Penarroya	Spain	Coal, etc		500	55.00	1,015.00	1,025.00
Rebecca	Colo'do, U. S.	Gold	5,000,000	25		1.25	1.25
Salines de l'Est	France	Salt		500	6.00	279.00	275.00
Salines du Midi	"	"		500	40.00	890.00	890.00
Vielle Montagne	Belgium	Zinc	9,000,000	30	30.00	565.00	565.00

SALT LAKE CITY.* July 26.

Name of Company	Shares.	Par Val	High.	Low.	Sales.
Ajax	300,000	$10	$0.33	$0.29	11,800
Ben Butler	500,000	1	.11½	.10½	3,000
California	300,000	1	.31¼	.17¾	42,100
Carisa	500,000	1	.29¼	.26¾	10,200
Century	150,000	1	.55	.38	4,800
Con. Mercur	1,000,000	5	2.06	2.00	5,480
Daly	150,000	20	2.00	2.00	200
*Daly-Judge			12.00	10.80	4,995
Daly-West	150,000	20	52.00	51.00	1,425
Eagle & B. Bell	250,000	1	1.17½	1.15	500
Grand Central	250,000	1	5.00	4.60	2,500
L. Mammoth	150,000	1	1.00	.85	1,600
Mammoth	400,000	25	1.24	1.21	400
May Day	400,000	.25	.21	.19¾	17,700
Sacramento	1,000,000	5	.31	.28	9,750
Star Con	500,000	1	.17½	.17½	200
So. Swansea	300,000	1	.....	.....	.....
Swansea	100,000	5	.85	.85	200
Tetro	500,000	5	.....	.....	.....
U. Sunbeam	250,000	1	.....	.....	.....
Uncle Sam	500,000	1	.26½	.26	1,000
Victor	500,000	1	.20½	.20½	500
West Mng. Gl'y	500,000	.10	.03¼	.03¼	1,000
Yankee Con	500,000	1	1.22	1.18	1,500

All mines are in Utah. *By our Special Correspondent. Total sales, 121,0o0 shares.

TORONTO, ONT. July 28.

Name of Company.	par val	High.	Low.	Sales.
Ontario:				
Olive	$1	.....	.....	.....
British Columbia:				
Cariboo McKinney	1	.21	.14	.....
Center Star	1	.42	.38	2,000
Fairview	1	.07¾	.06	23,600
Lone Pine	1	.07⅛	.05	.....
Mt. Lion	1	.25	.18	.....
North Star	1	.20	.15	1,500
Payne	1	.19	.15	1,500
Rambler-Cariboo	1	.85	.75	.....
Republic	1	.12	.10½	5,000
Virtue	1	.14	.08½	.....
War Eagle Con	1	.15	.12	.....
White Bear	1	.03½	.02½	1,000
Winnipeg	1	.05	.02	.....
Develop. Co				
Can. G. F. S	1	.04½	.03½	.....

Total sales, 34,000 shares.

DIVIDENDS.

GOLD, SILVER, COPPER, LEAD, QUICKSILVER AND ZINC COMPANIES.

Name and Location of Company.		Author-ized Capital Stock.	Shares. Issued.	Par Val	Dividends. Paid 1902	Total to Date.	Latest. Date.	Amt.
Aberdeen, c.	N. M.	$1,000,000	32,175	$25	.....	$32,175	Nov 1901	$1.00
Adams, s. l. c.	Colo.	1,500,000	150,000	10	$7,500	723,500	Feb. 1902	.05
Aetna Con., q.	Cal.	500,000	100,000	5	.....	225,000	Apr. 1900	.15
Alaska Goldfields	Alaska.	1,500,000	250,000	5	.....	260,000	Jan. 1901	.54
Alaska-Mexican, g.	Alaska.	1,000,000	180,000	5	.....	465,381	Oct. 1900	.10
Alaska-Treadwell, g.	Alaska.	5,000,000	200,000	25	225 000	5,045,000	July 1902	.37½
Amalgamated, c.	Mont.	155,000,000	1,538,879	100	3,077,757	18,887,248	Aug. 1902	.50
Am. Sm. & Ref., pf.	U. S.	50,000,000	500,000	100	2,625,000	8,916,553	July 1902	1.75
Am. Zinc, L. & Sm.	Mo	2,500,000	60,000	25	.....	180,000	Jan. 1900	1.00
Anaconda, c.	Mont.	30,000,000	1,200,000	25	600,000	21,450,000	May 1902	.50
Arizona, c.	Ariz.	3,775,000	.....	...	694,190	3,024,859	May 1902	....
Atlantic, c.	Mich.	1,000,000	40,000	25	.....	940,000	Feb. 1901	2.00
Bald Butte, g. s.	Mont.	250,000	250,000	1	105,000	1,222,148	July 1902	.06
Boston, q	Cal.	1,000,000	100,000	10	.....	20,000	Jan. 1900	.10
Boston & Colo Sm.	Colo.	750,000	15,000	50	33,750	394,100	July 1902	.75
Boston Gold-Copper Sm.	Colo.	1,000,000	1,000,000	1	.....	150,000	Nov 1901	.02½
Boston-Little Circle, z. l.	Mo	100,000	100,000	1	.....	112,500	Oct 1901	.25
Boston & Mont. Con., c. s. g.	Mont.	3,750,000	150,000	25	600,000	26,825,000	July 1902	2.00
Breece, l. s.	Colo.	5,900,000	200,000	25	10,000	180,000	June. 1902	.05
Buffalo Hump, g.	Idaho.	1,000,000	100,000	10	.....	300,000	Jan. 1901	.10
Bullion-Beck & Champion	Utah.	1,000,000	100,000	10	.....	2,498,400	June. 1900	.10
Bunker Hill & Sullivan.	Idaho	3,000,000	300,000	10	111,000	1,397,000	July 1902	.03
Butte & Boston, c.	Mont.	2,000,000	200,000	10	.....	1,600,000	Nov. 1901	3.00
Butterfly-Terrible, g.	Colo.	1,500,000	1,250,000	1	.....	31,250	Oct 1901	.00½
Calumet & Hecla, c.	Mich.	2,500,000	100,000	25	1,500,000	78,850,000	May 1902	5.00
Carisa g. s. c.	Utah.	500,000	500,000	1	.....	30,000	Nov. 1901	.03
Centennial Eureka, g. s. l. c.	Utah.	5,000,000	100,000	25	50,000	2,667,700	Jan. 1902	.50
Center Creek, l. z.	Mo	1,000,000	100,000	10	10,000	80,000	Mar 1902	.10
Central Eureka, g.	Cal	4,000,000	398,425	10	.....	15,750	Sept. 1901	.02½
Central, l.	Mo	1,000,000	10,000	100	35,000	300,000	July 1902	.50
Cherry Hill, g.	Cal	1,000,000	1,000,000	1	17,500	50,000	July 1902	.00¼
Chippewa Con., g. s. l.	Colo.	250,000	250,000	1	1,250	1,250	June 1902	.00½
Con. Cal. & Va., s. g.	Nev.	540,000	216,000	2½	.....	3,963,600	July 1901	.10
Con. Mercur (New), g.	Utah.	5,000,000	1,000,000	5	275,000	360,000	Aug. 1902	.03
Continental, z.	Mo	550,000	22,000	25	8,800	8,800	July 1902	.40
Creede & Crip. C'k., g.	Colo.	800,000	800,000	1	.....	16,000	May 1901	.02
Cripple Creek, g pf.	Colo.	125,000	125,000	1	5,000	45,000	Jan. 1902	.04
Croesus, g.	Cal	1,000,000	200,000	5	.....	227,300	Aug 1901	.05
Crowned King, g. s.	Ariz.	6,000,000	600,000	10	.....	242,760	May 1901	.02
Dalton & Lark, g. s. l.	Utah.	2,500,000	2,500,000	1	.....	350,000	July 1901	.10½
Daly-West, (New).	Utah.	3,600,000	180,000	20	312,000	312,000	July 1902	.60
De Lamar, (New), g. s.	Idaho	400,000	67,181	5	81,121	97,413	July 1902	.48
Dewey Con., g.	Utah.	10,000	10,000	1	.....	5,850	June. 1901	.10
Doctor-Jack Pot Con., g.	Colo.	3,000,000	2,900,000	1	.....	232,000	Aug 1901	.01
Doe Run, l.	Mo	1,500,000	10,000	100	45,000	522,072	July 1902	1.50
Ducktown c. l. sul. (Ord).	Tenn.	374,000	74,800	5	.....	165,250	Dec. 1901	.25
Ducktown (Fndr).	Tenn.	1,000	200	5	.....	75,250	May 1901	75.00
Elkton Con., g.	Colo.	3,000,000	2,500,000	1	100,050	1,404,461	Mar 1902	.04
Empire State-Idaho, l. s.	Idaho	6,000,000	505,542	10	176,939	1,435,277	July 1902	.05
Ferris-Haggarty, c.	Wyo.	1,000,000	1,000,000	1	.....	15,000	Sept. 1901	.01
Florence, s.	Mont.	2,500,000	400,000	5	.....	223,780	Mar. 1900	.05
Gemini.	Utah.	500,000	5,000	100	.....	700,000	Aug. 1900	10.00
Gold Coin of Victor, g.	Colo.	1,000,000	1,000,000	1	210,000	1,170,000	July 1902	.03
Gold King, g.	Colo.	1,000,000	936,850	1	.....	412,214	July 1901	.03
Golden Cycle, g.	Colo.	2,000,000	1,600,000	1	11,250	11,250	July 1902	.00¼
Golden Eagle, g.	Colo.	500,000	489,015	1	.....	98,916	Sept. 1901	.01
Grand Central, g.	Utah.	250,000	250,000	1	.....	691,250	Nov 1900	.10
Gwin, g.	Cal	1,000,000	100,000	10	115,000	376,500	July 1902	.15
Hecla, l. s.	Idaho	250,000	1,000,000	¼	.....	100,000	Dec. 1900	.02
Hecla Con., s. l.	Mont.	1,500,000	30,000	50	.....	2,250,000	July 1901	.50
Helena Con., g.	Ore.	1,500,000	1,300,000	1	71,500	189,500	July 1902	.01½
Hidden Treasure, g.	Cal	380,000	36,000	10	.....	457,452	Sept. 1900	.10
Holy Terror, g.	S. D.	500,000	500,000	1	.....	172,000	Jan. 1900	.01
Homestake, g.	S. D.	21,840,000	218,400	100	735,000	11,388,750	July 1902	.50
Horn Silver, g. s. c. z. l.	Utah.	10,000,000	400,000	25	.....	5,342,000	Dec. 1901	.10
Independence Con., g.	Colo.	2,500,000	2,500,000	1	.....	281,375	Apr. 1901	.04
Ingham Con., g.	Colo.	750,000	1,359,600	½	.....	33,981	Aug. 1901	.00¼
Iowa, g. s. l.	Colo.	1,666,667	1,666,667	1	50,001	253,502	July 1902	.01
Iron Silver.	Colo.	10,000,000	500,000	20	.....	2,550,000	Dec 1900	.10
Isabella, g.	Colo.	2,250,000	2,250,000	1	.....	742,500	Mar. 1901	.01
Jamison g.	Cal.	3,900,000	390,000	10	.....	62,400	Sept. 1901	.03
Katinka, g.	Colo.	1,000,000	1,000,000	1	.....	10,000	Nov 1901	.01
Kendrick & Gelder Sm.	Colo.	1,000,000	1,000,000	1	.....	20,000	Dec. 1901	.01
Kennedy, g.	Cal.	10,000,000	100,000	100	.....	1,801,000	June. 1901	.05
La Fortuna, g.	Ariz.	250,000	250,000	1	100,000	1,176,000	July. 1902	.05
Last Dollar, g.	Colo.	1,500,000	1,500,000	1	.....	180,000	Dec. 1901	.02
Lightner, g.	Cal.	125,000	102,255	1	5,113	33,230	July. 1902	.05
Lillie, g.	Colo.	1,250,000	250,000	5	.....	349,183	Apr. 1900	.05
Mammoth, g. s. c.	Utah.	10,000,000	400,000	25	.....	1,840,000	July. 1901	.05
Mary McKinney, g.	Colo.	1,000,000	1,000,000	1	90,000	450,000	July 1902	.03
May Day, g.	Utah.	100,000	400,000	¼	12,000	30,000	Mar. 1901	.01
Midget, g.	Colo.	1,000,000	1,000,000	1	30,000	195,000	Apr. 1902	.15
Modoc, g. s.	Colo.	500,000	500,000	1	20,000	250,000	Apr. 1902	.01
Mont. Ore Purchasing.	Mont.	2,500,000	81,000	25	162,000	2,484,000	Aug. 1902	2.00
Monument, g.	Colo.	300,000	300,000	1	.....	21,124	Feb. 1901	.01
Morning Star Drift, g	Cal	240,000	2,400	100	.....	854,400	Sept. 1900	3.00
Mountain, c.	Cal	6,250,000	250,000	25	300,000	3,393,750	Apr. 1902	1.20
Mt. Diablo, s.	Nev.	5,000,000	50,000	100	.....	280,271	Jan. 1900	.10
Napa Con., q.	Cal	700,000	100,000	7	30,000	1,170,000	July. 1902	.10
National Lead, com.	U. S.	15,000,000	149,054	100	.....	1,341,486	Mar. 1900	1.00
National Lead, pfd.	U. S.	15,000,000	149,040	100	521,640	12,405,200	June. 1902	1.75
New Idria, q.	Cal	5,000,000	100,000	5	50,000	370,000	July. 1902	.20
New Jersey, z.	U. S.	10,000,000	100,000	100	700,000	3,900,000	Feb. 1902	7.00
New Leadville Home, g.	Colo.	2,000,000	2,000,000	1	25,000	265,500	Feb. 1902	.00⅝
Nugget, g.	Colo.	1,000,000	991,000	1	.....	84,730	July. 1901	.01
Old Colony Zinc & Sm.	Mo	1,000,000	69,969	10	.....	138,184	Nov 1901	.25
Omega, g.	Cal	1,500,000	1,200,000	1	.....	18,188	June. 1900	.01½
Ontario, s. l.	Utah.	15,000,000	150,000	100	135,000	14,872,000	Sept. 1902	.30
Osceola, c.	Mich.	2,500,000	96,150	25	.....	4,247,300	Dec. 1901	3.00
Parrot, c.	Mont.	2,300,000	229,850	10	114,925	5,772,925	Jan. 1902	.50
Penn. Con., g.	Cal	5,150,000	51,500	100	.....	161,325	May 1900	.10
Plumas Eureka, g.	Cal	1,406,250	150,625	10	.....	2,831,294	Apr. 1901	.24
Pointer, g	Colo.	1,250,000	1,250,000	1	.....	25,000	June. 1901	.01
Portland, g.	Colo.	3,000,000	3,000,000	1	180,000	4,207,080	Jan. 1902	.06
Quicksilver, pfd.	Cal	4,300,000	43,000	100	21,500	1,909,911	May 1902	.50
Quincy, c.	Mich.	2,500,000	100,000	25	700,000	13,570,000	Aug. 1902	3.00
Richmond, g. s. l.	Nev.	1,350,000	54,000	25	.....	4,453,797	Dec. 1900	.24
Rocco-Homestake, g. s.	Nev.	300,000	300,000	1	22,500	76,500	May 1902	.01½
Sacramento, g.	Utah.	5,000,000	1,000,000	5	.....	133,000	Aug 1901	.00½
St. Joseph, l.	Mo	3,000,000	250,000	10	75,000	3,534,500	June. 1902	.15
Santa Rita, g.	Colo.	1,000,000	1,000,000	1	.....	4,000	July. 1900	.02
Silver King, g. s. l.	Utah.	3,000,000	150,000	20	700,000	5,450,000	July. 1902	.66⅔
Silver Shield, g.	Utah.	300,000	300,000	1	.....	4,500	Feb. 1901	.00½
Smuggler, s. l. z.	Colo.	1,000,000	1,000,000	1	20,000	2,175,000	Feb. 1902	.01
Southern Boy, g.	Colo.	1,250,000	875,000	1	.....	17,500	May 1900	.02
South Swansea, s. l.	Utah.	300,000	275,000	1	.....	167,500	Mar. 1901	.05
South Winnie, g. s.	Colo.	250,000	250,000	1	.....	15,000	Sept 1901	.01
Standard Con., g. s.	Cal	2,000,000	178,394	10	35,678	4,071,136	May 1902	.10
Standard, s. l.	Idaho.	500,000	500,000	1	100,000	2,565,000	Apr. 1902	.05
Stratton's Independence, g.	Colo.	5,500,000	1,000,007	5	240,000	3,770,860	Apr. 1902	.12
Strong, g.	Colo.	1,000,000	1,000,000	1	175,000	2,075,000	July 1902	.02½
Swansea, s. l.	Utah.	500,000	100,000	5	.....	330,500	June 1901	.05
Tamarack, c.	Mich.	1,500,000	60,000	25	.....	8,490,000	Dec. 1901	10.00
Tomboy (New), g. s.	Colo.	1,500,000	300,000	5	72,000	404,000	July. 1902	.24
Town Topics, g. c.	Colo.	1,000,000	1,000,000	1	5,000	20,000	Jan. 1902	.00½
Uncle Sam Con.	Utah.	500,000	500,000	1	.....	45,000	Nov. 1901	.03
Union, g.	Colo.	1,250,000	1,250,000	1	25,000	445,244	Jan. 1902	.02
Union, z. l.	Kas.	500,000	300,000	1	.....	16,000	July. 1901	.01
United, g.	Colo.	5,000,000	3,934,769	1	119,844	119,844	Aug. 1902	.01
United, z. l., com.	Mo	5,000,000	74,990	5	11,247	11,247	July. 1902	.05
United, z. l., pfd.	Mo	1,000,000	14,998	25	22,497	82,556	July. 1902	.50
United Verde, c	Ariz.	3,000,000	300,000	10	.....	10,785,322	Dec .. 1901	.75
U. S. Red. & Ref., com	Colo	6,000,000	58,850	100	117,700	117,700	July 1902	1.00
U. S. Red. & Ref., pf.	Colo.	4,000,000	39,233	100	176,548	294,249	July. 1902	1.50
Utah, g	Utah.	1,000,000	100,000	10	2,000	197,000	July. 1902	.02
Utah Con., c.	Utah.	1,500,000	300,000	5	.....	732,000	Dec.. 1902	1.22
Vindicator Con., g.	Colo.	1,500,000	1,100,000	1	198,000	862,000	July. 1902	.05
Wolverine, c.	Mich.	1,500,000	60,000	25	120,000	870,000	Apr. 1902	2.00
Yankee Con., g. s. l.	Utah.	500,000	500,000	1	75,000	75,000	Apr. 1902	.05
Yellow Aster, g.	Cal	1,000,000	100,000	10	.....	459,410	Dec. 1900	.10

COAL, IRON AND INDUSTRIALS.

Name and Location of Company.		Author-ized Capital Stock.	Shares. Issued.	Par Val	Dividends. Paid 1902.	Total to Date.	Latest. Date.	Amt.
Ala. Con., Coal & Iron, pfd.	Ala.	$2,500,000	$25,000	$100	$87,500	$481,250	June, 1902	$1.75
Allis-Chamlers, pfd.	U. S.	25,000,000	162,500	100	853,125	1,421,875	Aug. 1902	1.75
Altoona Coal & Coke.	Pa.	2,500,000	250,000	10	.....	75,000	Jan. 1901	.30
American Agr. Chem., pfd.	U. S.	20,000,000	171,350	100	514,050	3,068,640	Apr. 1902	3.00
American Cement.	Pa.	2,100,000	200,000	10	160,000	380,000	July 1902	.40
American Coal.	Md.	1,500,000	60,000	25	75,000	1,207,500	Mar. 1902	1.25
American Iron & Steel, com.	Pa.	17 000,000	34,000	50	10,200	256,100	May 1902	.15
American Iron & Steel, pfd.	Pa.	3,000,000	60,000	50	112,500	412,500	July 1902	.62½
Aztec Oil	Cal.	250,000	250 000	1	7,500	7,500	June. 1902	.03
Bethlehem Steel.	Pa.	15,000,000	300,000	50	.....	1,325,000	Sept. 1901	.25
California Oil & Gas.	Cal.	2,000,000	200,000	10	.....	540,000	Sept. 1901	.70
Cambria Steel (New).	Pa.	50,000,000	900,000	50	1,350,000	1,350,000	Aug. 1902	.75
Central Coal & Coke, com.	Mo	1,875,000	18,750	100	58,125	118,125	July 1902	1.50
Central Coal & Coke, pfd.	Mo	1,875,000	18,750	100	60,937	679,687	July 1902	1.25
Central Oil.	W.Va.	1,500,000	60,000	25	45,000	112,500	Aug. 1902	.25
Central Oil.	Cal.	1,000,000	800,000	1	24,000	160,247	Jan. 1902	.03
Central Point Con. Oil.	Cal.	200,000	190,000	1	.....	45,600	Dec. 1901	.02
Colorado Fuel & Iron, com.	Colo.	38,000,000	239,310	100	805,000	1,642,500	Apr. 1902	1.75
Colorado Fuel & Iron, pfd.	Colo.	2,000,000	20,00	100	160,000	1,480,000	Aug 1902	4.00
Consolidation Coal.	Md.	10,250,000	102,500	100	205,000	5,523,000	Feb. 1902	2.00
Consolidated Coal.	Ill.	5,000,000	50,000	100	50,000	160,000	Jan. 1902	1.00
Continental Oil.	Cal.	300,000	260,000	1	.....	10,400	July 1901	.01
Crucible Steel, pfd	U. S.	25,000,000	250,000	100	1,312,500	3,062,500	June. 1902	1.75
Dabney Oil.	Cal.	1,000,000	1,000,000	1	.....	10,000	May. 1901	.01
Empire Steel & Iron, pfd	U. S.	5,000,000	23,700	100	71,042	319,892	July. 1902	1.50
Federal Chem., pfd	Ky.	1,000,000	15,000	100	67,500	67,500	July 1902	1.50
Four Oil.	Cal.	300,000	300,000	1	12,000	27,000	July. 1902	.01
General Chem., com.	U. S.	12,500,000	74,103	100	148,158	781,815	June. 1902	1.00
General Chem., pfd.	U. S.	12,500,000	94,160	100	423,720	1,833,938	July 1902	1.50
Gray Eagle Oil.	Cal.	250,000	100,000	2½	.....	217,000	May. 1901	47
Hanford Oil.	Cal.	20,000	2,000	10	2,000	8,000	Jan. 1902	1.00
Heywood Oil.	Tex.	800,000	800,000	1	.....	32,000	Nov. 1901	.04
Higgins Oil.	Tex.	2,500,000	17,609	100	96,850	96,850	Apr. 1902	.50
Home Oil	Cal.	100,000	100,000	1	52,500	412,500	July. 1902	1.07½
Homestake Oil.	Cal.	100,000	10,000	10	.....	31,500	Aug. 1901	.15
Houston Oil, pfd.	Tex.	7,500,000	75,000	100	224,125	448,250	Mar. 1902	3.00
Imperial Oil.	Cal.	1,000,000	100,000	100	160,000	160,000	July. 1902	3.20
Int'l Acheson Graphite, pfd.	N. Y.	500,000	5,000	100	17,500	52,500	Feb. 1902	3.50
Jeff. & Clearf., Coal & Iron, com.	Pa.	1,500,000	15,000	100	75,000	105,000	Aug. 1902	5.00
Jeff. & Clearf., Coal & Iron, pfd.	Pa.	1,500,000	15,000	100	75,000	525,500	Aug. 1902	2.50
Kern River Oil	Cal.	200,000	20,000	5	10,000	40,000	Feb. 1902	2.50
Lehigh Coal & Nav.	Pa.	14,346,650	286,933	50	430,399	19,808,187	May. 1902	.50
Maryland Coal, pfd.	Md.	2,000,000	18,850	100	47,125	791,669	July. 1902	2.50
Monongahela R. Coal, pfd.	Pa.	10,000,000	198,300	50	1,041,495	2,082,990	July. 1902	1.75
Montana Coal & Coke.	Mont.	5,000,000	200,000	25	.....	120,000	Oct. 1900	.03
National Salt, com.	U. S.	7,000,000	70,000	100	.....	615,000	Nov. 1901	1.50
National Salt, pfd.	U. S.	5,000,000	50,000	100	.....	875,000	Nov. 1901	1.75
New Central Coal.	Md.	1,000,000	50,000	20	.....	510,000	Apr. 1900	.40
Ohio & Indiana Natural Gas.	U. S.	10,000,000	90,000	100	180,000	900,000	June. 1902	1.00
Oil City Petroleum	Cal.	500,000	500,000	1	.....	15,000	Nov. 1901	.02½
Pacific Coast Borax.	Cal.	2,000,000	19,000	100	133,000	1,122,500	July. 1902	1.00
Peerless Oil.	Cal.	1,000,000	100,000	10	21,000	21,000	Aug. 1902	.06
Pennsylvania Salt Mfg.	Pa.	5,000,000	100,000	50	150,000	13,000,000	Apr. 1902	3.00
Penna. Steel, pfd	Pa.	25,000,000	165,000	100	247,500	825,000	May 1902	3.50
Petroleum Dev.	Cal.	125,000	125,000	1	25,000	25,000	Mar 1902	.20
Philadelphia Gas, com.	Pa.	16,102,131	308,542	50	673,971	2,259,800	July. 1902	.75
Philadelphia Gas, pfd.	Pa.	3,988,350	79,967	50	199,918	599,754	June. 1902	1.25
Pittsburg Coal, pfd.	Pa.	32,000,000	297,012	100	1,680,000	5,838,168	July. 1902	1.75
Producers' & Con. Oil.	Cal.	1,000,000	10,000	100	.....	56,500	Mar. 1901	.10
Rep. Iron & Steel, pfd.	U. S.	25,000,000	203,569	100	1,060,113	4,264,451	July. 1902	1.75
Retsof Salt	N. Y.	5,000,000	36 000	100	108,000	540,000	July 1902	1.00
San Joaquin Oil.	Cal.	100,000	100,000	1	25,000	50,000	June. 1902	.05
Shawmut Oil.	W. Va.	1,250,000	50,000	25	25,000	125,000	June. 1902	.50
Shelby Iron.	Ala.	1,000,000	10,000	100	100,000	100,000	May. 1902	10.00
Sloss-Sheffield Steel & Iron, pfd.	Ala.	20,000,000	67,000	100	351,750	1,159,500	July. 1902	1.75
So. Cal. Oil & Fuel.	Cal.	300,000	200,000	1	.....	39,000	Nov. 1901	.01¾
Standard Oil (of N. J.).	U. S.	100,000,000	970,000	100	29,100,000	49,485,000	June. 1902	10.00
Sunday Lake Iron.	Mich	1,000,000	40,000	25	.....	40,000	Feb. 1901	1.00
Susquehanna I. & S., pfd	Pa.	1,500,000	300,000	5	90,000	672,500	July. 1902	.15
Temple Iron	Pa.	240,000	2,400	100	7,200	7,200	Jan. 1902	3.00
Tenn. C. I. & R. R., com.	Tenn.	23,000,000	225,536	100	.....	1,102,144	Nov. 1900	2.00
Tenn. C. I. & R. R., pfd	Tenn.	248,000	2,480	100	14,880	277,760	Aug. 1902	2.00
Tex. & Pacific Coal	Tex.	2,000,000	20,000	100	90,000	2,010,000	July. 1902	1.50
Thirty-three Oil.	Cal.	500,000	100,000	5	70,000	70,000	July. 1902	.10
Thomas Iron.	Pa.	2,500,000	25,000	100	200,000	200,000	Aug. 1902	4.00
Union Oil.	Cal.	10,000,000	52,672	100	179,084	297,595	July. 1902	.70
U. S. Crude Oil.	Cal.	100,000	100,000	1	.....	27,220	Dec. 1901	.02
U. S. Marble.	Wash.	2,000,000	2,000,000	1	15,000	53,750	Jan. 1902	.00¾
U. S. Steel Corp., com.	U. S.	550,000,000	5,084,952	100	15,254,254	29,443,361	Sept. 1902	1.00
U. S. Steel Corp., pfd.	U. S.	550,000,000	5,103,147	100	27,188,927	45,013,798	Aug 1902	1.75
Va.-Carolina Chem., com	U. S.	38,000,000	279,844	100	629,649	2,279,649	June 1902	1.25
Va.-Carolina Chem., pfd.	U. S.	12,000,000	120,000	100	720,000	5,820,000	July. 1902	2.00
Ventura Con. Oil	Cal.	1,000,000	1,000,000	1	5,000	5,000	Feb. 1902	.00½
Victoria Coal & Coke, com.	W. Va.	150,000	1,500	100	.....	15,000	Jan. 1901	10.00
Victoria Coal & Coke, pfd.	W. Va	100,000	1,000	100	6,000	15,000	July. 1902	3.00
Warner Oil.	Cal.	200,000	200,000	1	.....	10,000	June 1901	.01
Westmoreland Coal.	Pa.	5,000,000	250,000	50	375,000	7,125,000	Apr. 1902	1.50
West Shore Oil.	Cal.	100,000	100,000	1	10,000	30,000	June 1902	.05

CANADA, CENTRAL AND SOUTH AMERICA, MEXICO.

Name and Location of Company.		Author-ized Capital Stock.	Shares. Issued.	Par Val	Dividends. Paid 1902.	Total to Date.	Latest. Date.	Amt.
Amistad y Concordia.	Mex.	$480,000	9,000	$50	$50,564	$66,574	July. 1902	$1.78
Bartolome de Medina Mill.	Mex.	50,000	2,000	25	11,448	54,998	July 1902	1.28
Bosun, s.	B. C.	250,000	50,000	5	.....	12,500	Apr. 1901	.25
Cariboo McKinney, g.	B. C.	1,250,000	1,250,000	1	18,750	496,837	Mar. 1902	.01½
Center Star, g.	B. C.	3,500 000	3,500,000	1	.....	210,000	May. 1901	.01
Cinco Minores.	Mex.	.....	2,000	....	16,785	616,785	July. 1902	4.13
Copiapo, c.	Chile	1,125,000	112,500	10	.....	2,826,000	Dec . 1901	.60
El Oro, g. s.	Mex.	5,000,000	1,000,000	5	360,000	1,500,000	June. 1902	.36
Esperanza, s. g.	Mex.	150,000	3,000	50	89,820	1,010,409	July. 1902	4.26
Frontino & Bolivia c.	Colom.	643,310	128,662	5	.....	1,211,703	July 1901	.72
Goodenough, s. l.	B. C.	800,000	659,400	1	6,594	13,188	Jan. 1902	.01
Grand Central, g. s.	Mex.	1,500,000	250,000	5	.....	840,000	Jan. 1900	.48
Guadalupe Mill.	Mex.	1,000,000	10,000	100	85,106	3,467,050	July. 1902	1.65
Greene Con., c.	Mex.	6,000,000	600,000	10	.....	220,000	Sept. 1901	.20
Le Roi No. 2, g.	B. C.	3,000,000	120,000	25	144,000	288,000	May. 1902	1.20
Mesquital.	Mex.	125,000	250,000	½	.....	36,458	July. 1901	.08
Natividad, s. g.	Mex.	36,000	2,400	15	28,728	139,284	July. 1902	1.65
N. Y. & Hond. Rosario, s. g.	C. A.	1,500,000	150,000	10	105,000	1,775,000	July. 1902	.10
North Star, s. l.	B. C.	1,500,000	1,300,000	1	39,000	292,500	June. 1902	.01½
Nova Scotia St. & Coal, com.	N. S.	5,000,000	30,000	100	123,000	123,600	Apr. 1902	4.00
Nova Scot a St. & Coal, pfd.	N. S.	2,000,000	10,300	100	20,600	61,800	Apr. 1902	2.00
Payne Con., s. l.	B. C.	3,000,000	2,600,000	1	.....	1,438,000	Jan. 1901	.03
Penoles (Map.), s. l.	Mex.	125,000	2,500	50	875,213	1,725,763	July. 1902	21.31
Providencia (S. J.)	Mex.	90,000	6,000	15	35,940	136,080	July. 1902	.85
Rambler-Cariboo, s. l.	B. C.	1,250,000	1,250,000	1	87,500	175,500	July. 1902	.01
Reco, s. l.	B. C.	1,000,000	1,000,000	1	.....	278,500	Aug.. 1900	.10
St. John del Rey, g.	Brazil	3,000,000	534,868	5	70,760	13,935,235	June 1902	.12
San Carlos Minillas.	Mex.	12,500	2,500	5	22,150	234,329	Feb. 1902	4.43
Soledad, s. l.	Mex.	19,200	960	20	8,074	204,874	July. 1902

CHEMICALS, MINERALS, RARE EARTHS, ETC. CURRENT WHOLESALE PRICES.

(See also Market Reviews.)

	Cust.	Meas.	Price.
Abrasives—			
Carborundum, f.o.b. Niagara Falls, Powd., F. FF. FFF..	lb.		$0.08
Grains	"		.10
Corundum, N. C.	"		.07@.10
Chester, Mass.	"		.04½@.05
Barry's Bay, Ont.			.07½@.09½
Crushed Steel, f.o.b. Pittsburg	"		.05½
Emery, Turkish flour, in kegs.	"		.03½
Grains, in kegs	"		.05@.05½
Naxos flour, in kegs	"		.03½
Grains, in kegs	"		.05@.05½
Chester flour, in kegs	"		.03½
Grains, in kegs	"		.05@.05½
Peekskill, f.o.b. Easton, Pa., flour, in kegs	"		.01½
Grains, in kegs	"		.02½
Crude, ex-ship N. Y.: Abbott (Turkey)	lg. ton		26.50@30.00
Kuluk (Turkey)	"		22.00@24.00
Naxos (Greek) h. gr	"		.26.00
Garnet, as per quality	sh. ton		25.00@35.00
Pumice Stone, Am. powd.	lb.		.01½@.02
Italian, powdered	"		.01½
Lump, per quality	"		.04@.40
Rottenstone, ground	"		02½@.04½
Lump, per quality	"		.06@.20
Rouge, per quality	"		.10@.30
Steel Emery, f.o.b. Pittsburg	"		.07
Acids—			
Boracic, crystals	"		.10¾@.11
Powdered	"		.11¼@.11½
Carbonic, liquid gas			.12½
Chromic, crude			.20
Hydrofluoric, 30%	"		.05
48%	"		.05
60%	"		.11
Sulphurous, liquid anhy.	"		.05
Alcohol—Grain	gal.		2.43
Refined wood, 95@97%	"		.60@.65
Purified	"		1.20@1.50
Alum—Lump	100 lbs.		1.75
Ground	"		1.80
Powdered	"		3.00
Chrome, com'l	"		2.75@3.00
Aluminum—			
Nitrate	lb.		1.50
Oxide, com'l, common	"		.06½
Best	"		.20
Pure	"		.80
Hydrated	100 lbs.		2.60
Sulphate, pure	"		1.50@2.00
Com'l	"		1.15@1.25
Ammonia—			
Aqua, 16°	lb.		.03
18°	"		.03¼
20°	"		.03¾
26°	"		.05½
Ammonium—			
Carbonate, lump	"		.08¼
Powdered	"		.09
Muriate, grain	"		.05¾
Lump	"		.08¼
Nitrate, white, pure (99%)	"		.12
Phosphate, com'l	"		.09
Pure	"		.12
Antimony—Glass	"		.30@.40
Needle, lump	"		.05½@.06
Powdered, ordinary	"		.06¾@.07¼
Oxide, com'l white, 95%	"		.09½
Com'l white, 99%	"		.12
Com'l gray	"		.07
Sulphuret com'l	"		.16
Arsenic—White	"		.02¾@.03½
Red	"		.06¾@.07
Asphaltum—			
Ventura, Cal.	sh. ton		32.00
Cuban	lb.		.01½@.03½
Egyptian, crude	"		.05½@.06
Trinidad, refined	sh. ton		35.00
San Valentino (Italian)	lg. ton		16.00
Seyssel (French), mastic	sh. ton		21.00
Gilsonite, Utah, ordinary	lb.		.03
Select	"		.03¾
Barium—			
Carb. Lump, 80@90%	sh. ton		25.00@27.50
93@98%	"		26.00@29.00
Powdered, 80@90%	lb.		.01¾@.02
Chloride, com'l	100 lbs.		1.67½@1.76
Chem. pure cryst	lb.		05
Nitrate, powdered	"		.05½

	Cust.	Meas.	Price
Barium—			
Oxide, Am. hyd. cryst.	lb.		$0.02¾
Sulphate (Blanc Fixe)	"		.02
Barytes—			
Am. Crude, No. 1	sh. ton		9.00
Crude, No. 2	"		8.00
Crude, No. 3	"		7.75
German, gray	"		14.50
Snow white	"		17.00
Bauxite—Ga. or Ala. mines:			
First grade	lg. ton		5.50
Second grade	"		4.75
Bismuth—Subnitrate	lb.		1.40
Subcarbonate	"		1.65
Bitumen—"B"	"		.03½
"A"	"		.05
Bone Ash	"		.02¼@.02½
Borax	"		.07¼@.07½
Bromine	"		.40
Cadmium—Metallic	"		1.40
Sulphate	100 lbs.		2.00@2.50
Calcium—Acetate, gray	"		1.30
" brown	"		.90
Carbide, ton lots f.o.b. Niagara Falls, N. Y.. or Jersey City, N. J.	sh. ton		75.00
Carbonate, ppt.	lb.		.05
Chloride	100 lbs.		.75@.90
Cement—			
Portland, Am., 400 lbs.	bbl.		1.70@1.90
Foreign	"		1.65@2.25
"Rosendale," 300 lbs.	"		.75
Slag cement, imported	"		1.65
Ceresine—			
Orange and Yellow	lb.		.12
White	"		.13½
Chalk—Lump, bulk	sh. ton		2.50
Ppt. per quality	lb.		.03¾@.06
Chlorine—Liquid	"		.30
Water	"		.10
Chrome Ore—			
(50% ch.) ex-ship N. Y.	lg. ton		24.75
Sand, f.o.b. Baltimore	"		33.00
Bricks, f.o.b. Pittsburg	M		175.00
Clay, China—Am. com., ex-dock, N. Y.	lg. ton		8.00
Am. best, ex-dock, N. Y.	"		9.00
English, common	"		12.00
Best grade	"		17.00
Fire Clay, ordinary	sh. ton		4.25
Best	"		6.00
Slip Clay	"		5.00
Coal Tar Pitch	gal.		.08
Cobalt—Carbonate	lb.		1.75
Nitrate	"		1.50
Oxide—Black	"		2.26@2.30
Gray	"		2.28@2.40
Smalt, blue ordinary	"		.06
Best	"		.20
Copperas	100 lbs.		.42½
Copper—Carbonate	lb.		.18@.19
Chloride	"		.25
Nitrate, crystals	"		.35
Oxide, com'l	"		.19
Cryolite	"		.06½
Explosives—			
Blasting powder, A	25 lb. keg		2.65
Blasting powder, B	"		1.40
"Rackarock," A	lb.		.25
"Rackarock," B	"		.18
Judson R.R. powder	"		.10
Dynamite (20% nitro-glycerine)	"		.13
(30% nitro-glycerine)	"		.14
(40% nitro-glycerine	"		.15
(50% nitro-glycerine)	"		.16½
(60% nitro-glycerine)	"		.18
(75% nitro-glycerine)	"		.21
Glycerine for nitro (32 2-10° Be.)			.12⅞@.13
Feldspar—Ground	sh. ton		8.00@9.00
Flint Pebbles—Danish, Best.	lg. ton		14.75
French, Best	"		11.75
Fluorspar—			
Am. lump, 1st grade	sh. ton		$14.40
2d grade	"		13.90
Gravel and crushed, 1st gr.	"		13.40
2d grade	"		12.40
Ground, 1st grade	"		17.90
2d grade	"		16.50
Foreign, lump	"		8.00@12.00
Ground	"		11.50@14.00
Fuller's Earth—Lump	100 lbs.		.75
Powdered	"		.80

	Cust.	Meas.	Price
Graphite—Am. f.o.b. Providence, R. I., lump	sh. ton		$8.00
Pulverized	"		30.00
German, som. pulv	lb.		.01¼@.01½
Best pulverized	"		.01½@.02
Ceylon, common pulv	"		.02¾@.03½
Best pulverized	"		.04@.08
Italian, pulv	"		.01¼
Gypsum—Ground	sh. ton		8.00@8.50
Fertilizer	"		7.00
Rock	lg. ton		4.00
English and French	"		14.00@16.00
Infusiorial Earth—Ground.			
American, best	"		20.00
French	"		37.50
German	"		40.00
Iodine—Crude	100 lbs		2.45
Iron—Muriate	lb.		.05
Nitrate, com'l	"		.01¼
True	"		.04
Oxide, pure copperas col	"		.05@.10
Purple-brown	"		.02
Venetian red	"		.01@.01½
Scale	"		.01@03
Kaolin—(See Clay. China.)			
Kryolith—(See Cryolite.)			
Lead—Acetate, white	"		.07¾@.08
Brown	"		.06
Nitrate, com'l	"		.06½
" gran	"		.08¼
Lime—Com., abt. 250 lbs.	bbl.		.80
Finishing	"		.90
Magnesite—Greece.			
Crude (95%)	lg. ton		6.50@7.00
Calcined	sh. ton		14.00@15.00
Bricks	M		170.00
Am. Bricks, f.o.b. Pittsburg	"		175.00
Magnesium—			
Carbonate, light, fine pd	lb.		.05
Blocks	"		.07@.09
Chloride, com'l	"		.01¾
Fused	"		.20
Nitrate	"		.60
Sulphate	100 lbs.		.75@.95
Manganese—Powdered, 70@75% binoxide	lb.		.01¼@.01½
Crude, pow'd. 75@85% binoxide	"		.01½@.02¼
85@90% binoxide	"		.02¼@.03¼
90@95% binoxide	"		.03¼@.05½
Carbonate	"		.16@.20
Chloride	"		.04
Ore, 50%, Foreign	unit		.20@.21
Domestic	"		.30
Marble—Flour	sh. ton		6.00@7.00
Mercury—Bichloride	lb.		.77
Mica—N. Y. gr'nd, coarse	"		.03@.04
Fine	"		.04@.05
Sheets, N. C., 2x4 in.	"		.30
3x3 in	"		.80
3x4 in	"		1.50
4x4 in	"		2.00
6x6 in	"		3.00
Mineral Wool—			
Slag, ordinary	sh. ton		19.00
Selected	"		25.00
Rock, ordinary	"		32.00
Selected	"		40.00
Nickel—Oxide, No. 1	lb.		1.00
No. 2	"		.60
Sulphate	"		.20@.21
Oils—Black, reduced 29 gr.:			
25@30, cold test	gal.		.09¾@.10¼
15, cold test	"		.10¾@.11¼
Zero	"		.11¾@.12¾
Summer	"		.09¼@.09¾
Cylinder, dark steam ref	"		.08¾@.10¼
Dark, filtered	"		.11¼@.15¾
Light filtered	"		.14¾@.17¾
Extra cold test	"		.21¾@.23¾
Gasoline, 86°@90°	"		.14@.19
Naphtha, crude, 68°@72°	bbl.		9.05
"Stove"	gal.		.12
Linseed, domestic raw	"		.65@.67
Boiled	"		.69
Calcutta, raw	"		.85
Ozokerite	lb.		.11½
Paints and Colors—			
Chrome green, common	"		.05
Pure	"		.16
Yellow, common	"		.10¼
Best	"		25
Lampblack, com'l	"		.04½
Refined	"		.07
Litharge, Am. powd	"		.04¾@.05¼
English flake	"		.08¼@.08½
Glassmakers'	"		.07¼@.08

	Cust.	Meas.	Price
Paints and Colors—			
Metallic, brown	sh. ton		$ 19.00
Red	"		16.00
Ocher, Am. common	"		9.25@10.00
Best	"		21.25@25.00
Dutch, washed	lb.		.04¾
French, washed	"		.01¼@.01⅞
Orange mineral, Am	"		.07¾@.08
Foreign, as to make	"		.08¼@.11¼
Paris green, pure, bulk	"		.12
Red lead, American	"		.05¾@.06
Foreign	"		.06⅜@.08
Turpentine, spirits	gal.		.46½@.47
White lead, Am., dry	lb.		.04½@.04¾
American, in oil	"		.05¼@.05¾
Foreign, in oil	"		.07¼@.09¼
Zinc, white, Am., ex dry	"		.04⅜@.04⅝
American, red seal	"		.06½
Green seal	"		.07
Foreign, red seal, dry	"		.05¾@.08½
Green seal, dry	"		.06½@.08½
Potash—			
Caustic, ordinary	"		.04⅞@.05
Elect. (90%)	"		.06½
Potassium—			
Bicarbonate cryst	"		.08¼
Powdered or gran	"		.14
Bichromate, Am	"		.08¼@.08¾
Scotch	"		.08½@.09
Carbonate	"		.03½@.03¾
Chromate	"		.35
Cyanide (98@99%)	"		.23
Kainit	lg. ton		9.05
Manure salt, 20%	100 lbs.		.66
Double Manure salt, 48@53%	"		1.12
Muriate, 80@85%	"		1.83
95%	"		1.86
Permanganate	lb.		.09¼@.10
Prussiate, yellow	"		.13⅝@.14
Red	"		.36
Sulphate, 90%	100 lbs.		2.11
96%	"		2.14
Sylvinit	unit		.39½
Quartz—(See Silica).			
Salt—N. Y. com. fine	sh. ton		2.00
N. Y. agricultural	"		1.50
Saltpetre—Crude	100 lbs.		3.35@3.50
Refined	"		4.25@4.62½
Silica—Best foreign	lg. ton		10.00@11.00
Ground quartz, ord	sh. ton		6.00@8.00
Best	"		12.00@13.00
Lump quartz	"		2.50@4.00
Glass sand	"		2.75
Silver—Chloride	oz.		65
Nitrate	"		35
Oxide	"		.85@1.10
Sodium—			
Bichromate	lb.		.06¼
Chlorate, com'l	"		.08¼
Hyposulphite, Am	100 lbs.		1.60@1.65
German	"		1.70@1.90
Peroxide	lb.		.45
Phosphate	"		.02¾
Prussiate	"		.11@.11½
Silicate, conc	"		.05
Com'l	"		.01
Sulphate, com'l	100 lb.		75@.82½
Sulphide	lb.		.01¼
Sulphite crystals	"		.02½
Sulphur—Roll	100 lbs.		1.85
Flour	"		1.90
Flowers, sublimed	"		2.15
Talc—N. C., 1st grade	sh. ton		13.75
N. Y., Fibrous, best	"		10.20
French, best	100 lbs.		1.25
Italian, best	"		1.62½
Tar—Regular	bbl.		1.95
Oil barrels	"		4.40
Tin—Crystals	lb.		.18¼
Oxide	"		.45
Uranium—Oxide	"		2.25@3.00
Zinc—Metallic, ch. pure	"		.07@.09⅞
Carbonate, ppt.	"		.09
Chloride solution, com'l	"		.02½
" granular	"		.04½@.04¾
Dust	"		.04½@.04¾
Sulphate	"		.02½@.02⅝

THE RARE EARTHS.

	Cust.	Meas.	Price
Boron—Nitrate	lb.		$1.50
Calcium—Tungstate (Scheelite)	"		.60
Cerium—Nitrate	"		10.00
Didymium—Nitrate	"		35.00
Erbium—Nitrate	"		40.00
Glucinum—Nitrate	"		20.00
Lanthanum—Nitrate	"		30.00
Lithium—Nitrate	oz.		.60
Strontium—Nitrate	lb.		06⅜@07
Thorium—Nitrate 49@50%	"		4.50
Uranium—Nitrate	oz.		.25
Yttrium—Nitrate	lb.		40.00
Zirconium—Nitrate	"		8.00

NOTE.—These quotations are for wholesale lots in New York unless otherwise specified, and are generally subject to the usual trade discounts. Readers of the ENGINEERING AND MINING JOURNAL are requested to report any corrections needed, or to suggest additions which they may consider advisable.